

ANUMUKTI

A JOURNAL DEVOTED TO NON-NUCLEAR INDIA

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"Every truth passes through three stages before it is recognized. In the first it is ridiculed, in the second it is opposed, in the third it is regarded as self-evident."

Arthur Schopenhauer

A few days back, I was talking to Suresh, a friend of long standing who has lived deep in the jungles and worked amongst tribals. "Who are these PEOPLE that you are trying to reach?" he asked. "If, what you want to say does not reach the really down and out, if it makes no difference to the life of the last person, then is what you are doing, worth doing?"

To all engaged in social activism, this is the central question - the 'Yakshaprashna'. It is a question that all of us need to ponder over. The bulldozer of development rolls on, ever more ruthlessly, crushing the weak. The displaced person or rather unperson feels, - whether she be the housewife who needs to trudge further everyday to gather fuel for the family's next meal; or the small child working his finger to the bone producing carpets out of his lost child-hood; or the senile old man staring vacantly at the brand-new 'sarovar' beneath which lies his home - powerless facing this relentless onslaught.

To empower the people, so that they don't continue living "half-lives", requires not only organisation but also knowledge. What you don't know, may kill you. And you need to know of ozone holes and china syndromes; of ppm's of CFC's and storage of MIC's.

It is a hopeful sign that a convention of the "project affected" people is being organised in Madhya Pradesh. The time has indeed come when all dispossessed whether due to dams, deforestation, nuclear power plants, giant mining projects, 'super' thermal power stations, city beautification schemes, wastelands development realise the common cause of their woes. The time has also come to reach out and the other 'dropouts' of development - the terrorists, the drug addicts, the goondas, the 'antinational separatists', etc. and bring them into the mainstream of public life in a way radically different from that being attempted by political parties and the law and order machinery today.

Long years ago, Gandhi gave us a talisman -

"Recall the face of the poorest and the most helpless man whom you may have seen and ask yourself if the step you contemplate is going to be of any use to him. Will it restore him to a control over his own life and destiny? In other words, will it lead to Swaraj or self rule for the hungry and also spiritually starved of your countrymen?"

Birthdays are for introspection. A time to look inward and a time to look forward. Anumukti enters its third year (a bit later than it ought to have to our continuing regret) determined to carry the truth from being ridiculed to being self evident. Gandhi's talisman remains our guiding star. All must join in the task to make the truth recognised by the "poorest, lowliest and the lost."

CHALO HARSUD

Millions of tribals and rural poor of our country are today fighting a battle for their survival; The forces of destruction in the name of development, unleashed in our country over four decades ago have already displaced over 8.5 million people and threatened the livelihood of the majority of our countrymen.

The government is going ahead with its plans for large scale projects, ignoring the advice of those who suggest that the ill-effects on the environment, the quality of life, and indeed the very culture of our people need first to be considered. Attempts to reason with the authorities have failed time and again.

Throughout the length and breadth of India the story is the same. Dams such as Tehri, Bodhghat, Inchanpalli, Suvarnarekha, Pcoyamkutty, Koel Karo, Sardar Sarovar, Narmada Sagar, Pollavarani, etc. threaten to drown forests and displace tribals and rural poor. Missile testing sites such as Baliapal and nuclear power plants such as Kaiga, Kakrapar, Koodankulam, Narora and Nagarjunasagar besides mining sites such as Singrauli, Jaduguda and Gandhamardan serve to destroy common lands and peoples' livelihoods. These projects have not only resulted in unmitigable losses but have never accrued the benefits, which were willfully overestimated to begin with. They have only contributed to the fuelling consumerism and in increasing disparities. The simple question, "who pays and who benefits?" remains unanswered, even as those displaced more than three decades ago from Bhakra, Koyna, Pong, Ukai and a score of other projects still seek justice from the nation.

The rising tide of struggle against such state sponsored destruction has been ignored, and sometimes even crushed by the government. The time has come for all of us to unite in a mass demonstration of collective strength. To effectively focus national and international attention on this just cause it would be appropriate to meet at Harsud in Madhya Pradesh where over 250,000 people to be displaced by the Narmada project are struggling to safeguard their lives and environment.

For too long have we struggled in isolation. For too long have the exploiters prevailed. In the manner of Gandhi let us now force an uncaring powerful few to take notice of the aspirations of the majority. Let us form a human wall to stop the destruction of our life support systems.

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Dumperial Designs

Last year, doctors in the Nigerian town of Koko started seeing patients with unexplained skin rashes, vomiting and headaches. The problems were traced to a dump, where barrels of waste shipped from Italian chemical factories were leaking poisons into air and water.

The discovery touched off a chain of events unprecedented in Africa, where environmental protection is often considered a luxury. The Nigerian government impounded Italian ships, arrested businessmen and threatened death sentences. The Italians took the waste home, only to encounter angry crowds on Italian docks who tried to keep the waste from being unloaded. The incident was not the only one of its kind. There have been more reports of dangerous dumping in the Third World, • from American incinerator ash in Guinea (presumably to make bricks) to Italian chemicals in Lebanon.

Bangladesh has been the latest target. Events of the past few months, have been alarming in this regard. Attempts are being made to import toxic and even radioactive industrial and medical waste in the guise of energy supplying materials. It is proposed to burn the waste and utilise the heat produced for electricity generation. These wastes have been totally rejected by industries in the U.S. The ash from the incinerator will have concentrated amounts of toxic materials which can have catastrophic effects on surface and ground water. The project had reached a sufficiently advanced stage of processing through the government when some officials and journalists raised an alarm. The government has now set up a committee to look into the matter. There are also strong rumours to the effect that a ship named Felicia/Khian Sea has dumped 15,000 tons of toxic wastes in the Bay of Bengal.

Hard figures on the trade in toxic waste are sparse. It is estimated that in the U.S. alone, 275 million tonnes of

industrial waste is produced each year. 135,000 tonnes are exported. But the pressure to export is increasing. Greenpeace reports that 3.7 million tonnes of waste of all sorts was shipped from industrialised to developing countries between 1986 and 1988.

The biggest incentive to export waste is money. As environmental regulations in rich countries have become more demanding, the cost of burying hazardous waste has risen sharply. In the U.S., it has increased from \$15 in 1980 to \$250 today. Incineration can cost \$1500 per tonne.

Groups such as Greenpeace want an outright ban on exports of hazardous waste. They say this will force firms to develop sound ways of recycling waste, or of changing processes to prevent its production in the first place.

In March this year, the United Nations Environment Programme (UNEP) finalised a treaty on the control of transboundary movement of hazardous waste. After much heated debate, in the end, only 34 of the 105 countries present at the convention in Basel, Switzerland, signed the treaty.

The treaty is riddled with loopholes and controversies which render it ineffective. It does not call for an outright ban on toxic waste trade. It merely regulates the trade. It only insists that the companies wishing to export waste will have to notify the government of the country importing it and receive prior informed consent. The treaty does not define what is 'hazardous'. Thus, there is little to stop an exporter from labelling waste as non-hazardous and leaving it upto the importer's detection abilities to spot the difference. There is no mechanism in the treaty to ensure that the waste can be handled adequately by the importer. A company can dump anywhere as long as it can 'persuade' a local official to say that it is all right to do so.

From: Third World Network Features

FOR THE SAKE OF PURITY OF TUNGA

Our river Tungabhadra has not dried up, it does flow through our villages even today! Nor have we felt it as unholy, in spite of the pollution; we do continue to seek her blessings, more especially on auspicious days. But we have to admit that she has suffered neglect. The people who believe that "progress" and "development" lies in using everything they set their eyes upon, came, as they came everywhere. They lured us into the belief that having a giant industry was a panacea for all our sufferings.

Thus some sixteen years ago Harihar Poly Fibres and GRASIM industries came to use our mother Tungabhadra. Their callousness resulted in multiplying our miseries. Our mother turned into a flow of chemical water - brown and stinking. Not only "large fish kills" started happening once in a while, but even our nets got devoured fast by the polluted water. Our agriculture suffered, our cattle became sick. Our women wondered where to clean clothes and utensils. Not only all of us elders, our children too became victims of "progress" loosing their health. Most sorry part of the situation was our failure to find a remedy to this.

We became absolutely helpless. This we learnt has happened everywhere, where the demon of industrialization has set its footprint. What can you do to a giant capitalist like the BIRLA? What can be done to the mighty State Government which has a Pollution Control Board and a Health Department that looks upon all this as a 'necessity for "NATIONAL GROWTH"? We talked and regretted, we fretted and feared. We felt we had no choice but to sacrifice ourselves to the satanic dance of modernizing our "backwardness"! Pure clean water of the Tungabhadra was to be a historical memory!

Some six years ago, one day our children did not return from their schools as usual. What happened? This mischievous lot that was always after us understood that if Tunga was to

"give us food" and all their unwanted demands and pranks were not to be found. They were still in the school even when darkness had engulfed the village. Something was really happening at the school. A group of trainee teachers had come from Gujarat. To be at the school those days children felt it was all fun, "nay real work and involvement!"

When our village teachers had sought help to host these teachers we supported them out of curiosity, more out of our traditional sense of hospitality. "Look upon the visitor as God himself."

But these visitors were very different people. They helped our children to handle glass test tubes and chemicals. Within a couple of days the children had selected and analysed soil of every field and that of the smallest farmer. It was amazing to see the entire plan of the village fields all prepared by our own "monkeys"! Not only the children learnt their self respect we too learnt the lessons of self discipline.

With the change in our children in less than fifteen days we too were affected. The evening discussions and the cultural programmes organised by these visitors brought more light and enthusiasm amongst us. This started slowly the rivulets of our finding out that we should not lose heart. We learnt how foolish it was to believe that a factory could give us happiness. We also felt that the mistake was to be corrected. But how?

We had gone as a mob previously under the leadership of politicians to storm the factory and seek compensation. But the result was totally devastating. Not only that some of us had to suffer physically because of police beatings but our morals too sank down. The politicians left us as they were purchased by the factory people. We lost faith in them and in ourselves and were thus doubly frustrated.

But after this teachers' camp we of government officials. This made us

purified, not someone from outside but all and everyone of us had to contribute. Our first lesson was not to have leaders. So we formed our village Parisar Samitis. These met and met again and again to think and to seek and to ask and to understand how best to start.

Luckily we thought of a "Vigil Line" in front of the factory. That was in October 1984. Some couple of hundred women and men stood there in silence to declare their unhappiness about the deterioration of the environment because of the effluents being poured into the river by the factory. Factory authorities had sought police protection and had created a scare. But looking at our peaceful nay silent demonstration understood us better. The police officer said, "how on earth could this factory management believe that these peaceful folk were going to be violent? You are within your rights to protest. We will not bother you." A current of happiness and confidence electrified us all. Perhaps this was the birth of the positive stream that started to change the waters of the Tunga.

News went round all the forty villages about this demonstration. In the next such demonstration the locally elected politicians and even the member of parliament had to join to claim empathy with the people. They had to follow the people. We gained confidence that saying 'NO' to pollution was having results. Even the factory authorities moved, sent feelers, asked for talks, agents came to pacify and discuss!

Camps in non-violent training, writing letters to concerned government officials, organising protest marches, environmental jathas, streams of action started trickling down from everywhere. We started deciding for ourselves about what next could be done.

Hiremath, a highly qualified man from Dharwad and one who had been with us since 1982 came up with the idea of burning up his man-made fibre clothes and wearing hand spun woven khadi. He was emulated by people from seven villages. Some burnt their clothes in front of the factory and some in front. How can we accept any wages? We have to

remember our fight for freedom against the British when Gandhiji gave us a call burn all foreign clothes. Durgapa Barki our fisherman from Medleri spoke to the women of the village a day previous to his deciding to burn his rayon clothes. "Why I am doing it is very simple to understand. It is not just giving up use of factory made clothes. We also have to see how we can cooperate to bring better living to our own village craftsmen. We will have to start buying our potters' pots prepared right here in the village and we will have to buy chappals made here by our neighbours!" More and more light started to shine on us as to what had gone wrong. And with each one coining forward to live up to seeking alternatives to evils of industrialization, our spirits soared.

Dr.Kaboor a noted physician gave up his roaring practice to join the folds of the volunteers. Dr.Pawar started as a "fellow traveller" but soon got so involved that he seems to have forgotten .that he has patients to attend. Dr.Pawar's sister had never ventured out of her home. Not only she, but her friend too joined us. Families from cities, households from villages, women from homes and workers from fields came and surrendered themselves to the cause that was finding real roots. They gave up their mundane needs, started constructive work, organising weekend camps and padayatras. Planting useful trees and preparing seedlings provided individuals not only means to earn but also an involvement in the movement for purifying Tungabhadra. These small actions and village meetings brought forth purer and purer blood to the body of the movement.

A daily wage earners' camp 'coolies' as they call themselves - was organised for a weekend. They were chosen by their village. Their village had assured them of three days wages. But at the end of the camp they would not accept the wages. 28 women and men all refused saying, "We had the privilege to represent our village. We have learnt so much here, and we received food without doing any work, slowly the water has changed its colour.

contribute to our fight against the factory." These and many more such sincere actions provided the haemoglobin to our anaemic society.

Journalists and lawyers, scientists and doctors, all started to join our efforts. The stream has now become a rivulet and is moving on to be a river.

Like a river our movement has grown. Something trickling from one corner, some drops from over a rock and so -on. Various sources everywhere contributing to make it a success.

In 1986 the state government of Karnataka joined hands with the factory to overwhelm us by leasing ten thousand hectares of village common lands of over four districts. These lands were given to a Joint Sector company to grow Eucalyptus trees to be used as raw material for the pulp and fibre production by the factory. People's rights on these common lands were taken away almost by a stroke of pen!

They wanted to thwart a river? But the tables 'got turned. It brought more people to join hands to fight the common enemy. Protest marches, "Pluck and Plant" programmes started in all four districts. Yes, the movement spread and got more strength. Instead of being with the people, the government had supported, no promoted, the cause of the factory. "Birds of a feather flock together", they say. But every action of theirs boomerangs!

Our pluck and plant demonstration was to pluck out the factory-planted eucalyptus trees to plant fruit and other more useful trees for the villagers. It provided a unique example of how things change. The assistant commissioner - representing the authorities and the government, - intervened between 2000 villagers and the 40 hoodlums who were engaged by the factory to create violence. He said we will be allowed to plant more useful trees supporting the villagers and replace 100 plants planted by the factory. Yes, the government at the grassroot level understood us better.

Not that we have won. Purifying Tunga is a dream we feel sometimes! But confidence.

The factory now sometimes runs its effluent treatment plant. Small beginnings in their minds are felt by us.

The state High-Court had sent a commission to investigate the state of destruction by pollution. It was more or less an attempt to condone the 'industry. But the truth came out in the commission's report. "There is a nalah from the factory to the river by which the effluent is directly put into the river without treatment." The report also made a request that "since this nalah has existed all these years the Pollution Control Board should permit it as of the day it was made." Thus it is that however much they try all their actions result in exposures of total neglect and callousness of all health and environmental regulations. It seems as if, they fall in the traps they have themselves laid.

The Samaj Parivartan Samudaya has let us find that "people need to and can develop a macro-perspective of a free democratic, secular, egalitarian, non-violent, non-exploitative and just society while working towards it on various issues in a micro-situation and by trying to build links with different sections at various levels." It has helped us find a wider perspective. We know we are not alone. We also know that our efforts are helping many more groups of people all over Karnataka and perhaps in other states too to find out what needs to be done.

Thus this small river of people's strength is slowly gaining involvement of more and more areas and groups. During this growth we have learnt many lessons. The most significant are the following:

1. Not to have a leader, or follow a call of an individual however powerful or imposing he might appear. But try and understand the problem - go to the roots and start correcting by small actions that can be taken by many.

2. Small actions, even writing a letter to officials by entire village people do carry weight. These limited actions also help in building up

6. Keep a relentless effort going

3. Demonstrations have their Usefulness as morale boosters but these should be held only after intensive training in non-violence and after having had thoughts and reflections on the action.

4. Ready-made solutions do no help. Seek solutions together. Mob actions appear encouraging at times, but often serve no useful purpose and may result in greater frustration.

5. Real action comes out of determination of a few. The determination comes after well considered reflection by the group. A real training in deciding and owning up responsibility.

on, on all fronts. Legal action as well as local action; constructive work as well as confrontation.

7. Let everyone feel that it is their own movement. City people and salaried people, farmers and coolies, women and old, all of them should contribute whatever they can to create a real people's movement. We will have to collect every drop of devotion and honest sacrifice.

8. This is a very difficult task, we know. But we are determined to see our mother Tunga purified.

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Report from Koodankulam

With the entry of farmers from Kanyakumari district, the resistance against the proposed nuke station at Koodankulam is taking a new turn. On 27th August, over 120 organisations representing farmers, fish workers, women, students and environmental groups said "No to Nukes". There were also representatives from various opposition parties barring CPI and CPM.

The meeting was chaired by Thomas Kochery of the National Fishworkers Federation. The delegates were convinced that nuclear power is an evil that has to be resisted with all one's might. Even the farmers, whose main concern is the diversion of waters from the Pechiparai dam - the major source of irrigation in Kanyakumari district - resolved that they would fight even if Pechiparai water is spared.

Till now, the Koodankulam campaign was lead by various fishworkers' unions, students and environmentalists. From now on, the movement will be coordinated by the newly formed Anti-Koodankulam Committee with Dr.Kumar Das, Ex-MLA as convenor. The meeting unanimously decided to conduct a signature campaign, continue the mass education and contact programme, hold workshops and seminars in colleges and organise a demonstration at Nagercoil in November this year as a

massive show of people's determination.

The South Indian environmentalists are meeting at Ootty in the Nilgiris on the 22 September to chart out their future action plans. This is bad news for nuclear barons especially in an election year. The Department of Atomic Energy (DAE) still remembers its earlier setback in Kerala where the proposal for the Kothamangalam Atomic Power Plant was withdraw because the people forced all the candidates to oppose the plant. A similar strategy is likely to evolve for Kaiga, Nagarjunasagar and Koodankulam.

Nuclear establishment has by now realised that its "education" programme has not been well received. From now on it seems that there will be more reliance on police and the other coercive apparatus of the government. For instance, Tom Kochery was asked by the Nagercoil administration to keep his activities confined to Kerala. Anton Gomez, a journalist who has been working among the fish workers of Tamil Nadu also had to face police highhandedness.

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Victory at Wackersdorf

Gorleben is a small village in the north of West Germany. It was chosen as the site of the republic's first large scale nuclear fuel reprocessing plant. However, strong antinuclear protests begun well before the commencement of work on the first phase of the plant forced the planner's to abandon plans and to look for an alternative.

Under the active patronage of the veteran Bavarian conservative Franz Josef Strauss who had been one of the main architects of the West German nuclear programme, Wackersdorf, a site in the south of the country began to be propagated since the early eighties. Here, the construction of a nuclear fuel complex was considered politically feasible. The population, living mainly on agriculture, was promised employment in this "high-tech" industry. Nobody expected any resistance.

A word about Herr Strauss. Known for long as the 'strong man' of W.German politics, his death last year prevented him from seeing the gradual dissolution of his nuclear dreams. Strauss had allowed West German ratification of the Non-Proliferation Treaty only after an amendment was passed which limited the period of the treaty to the year 1995. Precisely the year when both, the reprocessing plant at Wackersdorf. and the commercial scale fast breeder reactor at Kalkar were scheduled for completion. The combination of the two plants being an important step enabling FRG to make its own nuclear weapons!

The . resistance of the local population together with antinuclear initiatives from all over Germany, developed in a way not anticipated by politicians. Wackersdorf became a symbol of the 'nuclear state'. The government retaliated brutally - "The largest uninterrupted deployment of police and Bundesgrenzschutz (special task force for border protection) against protesters in conditions resembling civil war". Irritant gases and rubber

projectiles were used to crush demonstrators and to end blockades.

For a time it appeared that protests and appeals to reason were fruitless. With the growing resistance against the plant, the government merely increased its propaganda offensive. Only in 1987, did a change in attitude became perceivable. Of all the arguments against the plant - dangers of a nuclear accident; the health problems due to radiation during 'normal' operation; the fact that even after Wackersdorf the waste problem remained as insolvable as ever; the military implications of the programme; the evils of large scale industrialisation; the financial unviability of the programme; - only this last argument was eventually accepted by the authorities.

Slowly, one by one, the big financiers began to drop out of the project. The exodus began in 1985 when one of the largest electricity producers in FRG reduced its shares in the company responsible for operating Wackersdorf. After construction on the first phase of the plant had started, it became obvious that the financial outlay of 3 billion Marks was not realisable. More and more industrialists, declared the project as too expensive and not economically viable. With the death of F.J.Strauss, political commitment to the plant also declined. On the other hand, the British and the French governments offered cheaper fuel reprocessing at Windscale and Le Hague respectively. In an age of decreasing tensions between East and West, nuclear weapons' proponents in W.Germany seem to be losing ground.

Suddenly, no one in FRG is ready anymore to bear the financial risks involved in building new nuclear plants or other large related facilities. Neither the breeder in Kalkar, nor the dream of the German nuclear industry the thorium high-temperature reactor - ever seem likely to be built. Nuclear technology will, however, . remain an

export item.

What will happen to Wackersdorf?
Within the half-constituted ruins of the site, a research centre for solar energy is said to be planned. Siemens, the multinational giant wants to invest in this project. Thus, Europe's energy

future is likely to remain firmly in the hands of large industry. Without radical change in the economic system, the soft-energy future will be determined by the masters of the atomic past!

Rainer Adloff
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Report on Cuttack Seminar

One benefit of antinuclear protest in the vicinity of various nuclear power plants has been the great interest it has aroused in the issue of nuclear power in different parts of the country. The eastern region of the country being the coal belt, is not immediately threatened by reactor siting. Even nucleocrats admit that on their own accounting, nuclear generated electricity can compete with coal only 800 Inns from the pit heads. Besides the region is prone to severe cyclones and both these factors have for the present proved a constraint on reactor construction there.

However, in these times, when political considerations take primacy over good sense, natural barriers provide no guarantee of long lasting relief. Nuclear power's central funding proves too much of an attraction for impoverished state governments and their electricity boards to resist. Thus, the governments of both W.Bengal and Orissa despite the variation of ideology, covet nuclear power plants.

Prompt and active opposition by an informed public is the only safeguard against these assaults on the environment and the citizenry. Both W.Bengal and Orissa have been lucky in having public spirited groups which are alive to the nuclear menace and have organised preliminary meetings to debate the issue.

The seminar at Cuttack was a two-day affair on August 5th and 6th organised by The World Union and Utkal Gandhi Smarak Nidhi. Originally it was planned to have a debate between some antinuclear spokespersons and represen-

tatives of the Department of Atomic Energy (DAE). However, the persons invited by the organisers from DAE after accepting the invitations had second thoughts and decided that discretion was the better part of valour and hence did not turn up. Thus, there wasn't much debate though a number of papers were read on different aspects of the nuclear issue. The subjects ranged from nuclear weapons, safety, waste disposal, radiation hazards to biological systems, nuclear politics to the use of nuclear energy in medicine and agriculture. It needs to be pointed out regarding the last mentioned that the radioisotopes needed for such purposes are required in such trace amounts that there is *in* reality no connection between production of radioisotopes and nuclear power generation. Every time there is any discussion on the desirability or otherwise of nuclear power, these 'uses' are sure to be mentioned. Thus their 'usefulness' as the 'Shikhandi' of nuclear power technology is undeniable. There were also lively discussions on the role and the responsibility of scientists in bringing about social change.

The conference ended in a well attended public meeting which resolved that no nuclear plant construction should be started in Orissa without a public debate which would help the formation of a consensus on the issue. To facilitate such a debate, it is imperative that there be free flow of information from the DAE.

Ten Years of Fallout

In March 1979, the Shah had just left Iran, Jimmy Carter was the President of the United States, and the world suffered its first major nuclear plant disaster at Three Mile Island in Pennsylvania. Much has changed in the past decade, including the state of the nuclear industry. But one thing endures - the highly radioactive remains of the TMI reactor.

core

Disaster Strikes

When the first alarms sounded in the chilly predawn hours of March 28th, the operators at the almost new TMI-2 plant thought they were facing another routine malfunction. Indeed the series of small mistakes made before and during the TMI accident were surprisingly mundane.

A minor problem in the plant's plumbing caused the turbine of the TMI reactor to trip early in the accident, disconnecting it from the steam being produced by the hot reactor. The unconnected steam jetted into the night sky with a roar. Only mildly concerned, the shift supervisor's first call was to his counterpart at TMI-1 reactor, which was down for repairs, telling him that he would have to do without TMI-2's power.

It was at this point that the accident became serious. Critical water valves were mistakenly closed. Another was inadvertently stuck open. Operators shut down the emergency core cooling system at a time when it was badly needed, and then an hour into the accident mistakenly turned off the main coolant pumps. The water surrounding the core of the reactor slowly leaked out over a two hour period.

Bedeviled by flawed equipment, a shortage of key data about critical water levels and temperatures, and hundreds of warning lights and alarms, the TMI operators made a bad situation worse, and soon had the plant on the verge of catastrophe. Within minutes of closing the coolant pumps, the

began to overheat.

Meanwhile, a hole developed in the primary cooling system, allowing hundreds of thousands of gallons of radioactive water to fill the basement of the reactor's containment building to a depth of eight feet. Some of this water was automatically pumped into an auxiliary building, where small amounts of radioactive gases were released without warning into the sky.

As the temperature of the reactor core exceeded 5000 degrees Fahrenheit, the rods containing the uranium fuel ruptured. At least 70% of the core was damaged, and more than one third of it melted, flowing downwards like "hot olive oil," according to one expert's description. The molten remnants of the core then coagulated at the bottom of the reactor building.

Most of the details of what happened at Three Mile Island were not known until days after the most critical period had passed. The operators themselves and the nuclear experts from

around the country were puzzled by the event, misled by inaccurate gauge readings and reluctant to believe correct measurements because they were so far outside the norm. The plant's owners repeatedly misinformed the public in their haste to downplay the seriousness of the accident.

In the months and years since the accident, it has become clear that this was a most serious accident, one that could have caused immediate loss of human life. A grave tragedy was avoided at Three Mile Island in part because the core- was uncovered for only a brief period. In addition, because the plant had been in operation for just three months, the core contained only small amounts of radioactive fission products that are most dangerous to life. There is a controversy about whether deaths can be directly attributed to the accident. Even if it did not kill people, TMI revealed technical and human flaws in the safety systems essential to

the safe operation of nuclear plants. In the years since Three Mile Island, U.S. nuclear plants have experienced nearly 30,000 mishaps, some with the potential to have caused disasters more serious than that at Three Mile Island.

Picking up the Pieces

After several months of study, the presidential commission on the TMI accident estimated that the plant could be returned to service by 1984 at a cost of \$466 million - a challenging but feasible task. Ten years and nearly \$1 billion later, the project is still not finished. Not only is returning the plant to operation no longer being considered, the reactor's owners are attempting to get permission from officials to leave some radioactive material sealed inside for decades.

Like the construction and operation of nuclear plants, the cleanup of a destroyed reactor can be a minefield of optimistic projections, trial and error procedures and unpleasant surprises. Many of the techniques used to dismantle THI had to be invented and in some cases reinvented during the course of the project.

When the cleanup operation began, experts were confident that they would find the fuel assemblies intact. However, in 1982, when a remote camera was first lowered into the reactor vessel, workers found a large empty space where part of the core should have been. When they finally got access to the pressure vessel six years later, the cleanup crew found rest of the core - 20 tonnes of it buried in radioactive rubble at the bottom of the vessel.

These discoveries showed for the first time that part of the core had melted and the cleanup would be a vastly more complicated operation. The rubble, too radioactive to be approached by workers would have to be 'chopped into pieces and removed from the vessel by remotely controlled devices. Numerous pipes, pumps, walls and other equipment that had been contaminated by the slumping core would have to be extracted and stored as radioactive waste.

The centrepiece of the cleanup

effort is a huge steel and lead platform built over the reactor to give workers safe access to the core. Workers lower shovels, pliers, buckets, cutting torches and other devices through an 18 inch hole in the platform on 40 foot poles. These extend to the bottom of the reactor vessel, which is filled with water left over from earlier cleanup efforts. Debris from the damaged core is leaded into protective cannisters before being raised out of the water. Complicating the handling of this material is the fact that it is dangerously radioactive, even after a decade.

The cleanup is further hindered by the constant need to develop new types of remotely controlled equipment. All of these devices must be directed using special television cameras that are also lowered into the vessel. Early in the cleanup, bacteria and algae began flourishing in the warm water, limiting visibility to only a few inches. It was not uncommon for expensive equipment to be lost in the murky bowels of the pressure vessel, requiring costly recovery attempts.

Atop the platform the life of a cleanup worker is not easy. Even the thick layer of lead and steel is not enough to stop 10 millirems of radiation per hour from seeping out, roughly equivalent to getting a chest X-ray every 60 minutes. When large pieces of radioactive debris are pulled out of the water, radiation levels go far higher. For this reason workers are clothed in cumbersome decontamination suits and plastic smocks, layers of special gloves are peeled off and discarded every 15 minutes. Shifts are less than 4 hours and workers are permitted on the platform only one week in six.

The most difficult part of the operation is the removal of the solid layer of radioactive debris that coagulated at the bottom of the vessel, a process that is still going on. The cleanup crew uses a specially designed diamond tipped drill to break up the material, then winches the fragments some of which weigh half a ton, out of the reactor.

The projected completion date for

the cleanup operation has been postponed on almost an annual basis. The latest date is at the end of 1990, but there is simple room for more delay. Whereas company executives first said that the reactor would be restarted or at least fully decontaminated, they now plan to simplify their task by leaving some radioactive debris in the plant until at least 2020 - "post defuelling monitored storage," - in nuclear jargon.

The Aftermath

Three Mile Island has become a symbol of the nuclear industry's problems. Public concern has intensified and knowledgeable scientists and local officials have joined the chorus of opponents. California has passed a law forbidding more nuclear plants in the state until a solution to the waste problem has been found.

Safety devices and regulations in the pre-TMI era were clearly inadequate. Everything from control room layouts and the training of operators to the standards for particular welds had to be altered. This resulted in a great burden on the builders of many plants then still under construction. Components had to be replaced or rebuilt. Cost overruns already out of control, became astronomical.

The average construction cost of a nuclear plant built during the eighties in the U.S. has been \$3,700/kilowatt. During the heydays of the sixties the expectation was that nuclear plants would cost \$150/kilowatt to build.

Adding construction and operating costs today, nuclear power is twice as expensive as competing energy sources such as gas fired cogeneration or fluidized bed coal plants. At the time the nuclear costs have, gone up, technological improvements have allowed a reduction in the costs of these and other electricity sources. During the past five years, for example, the cost of installing solar photovoltaic cells has fallen from \$10,000 per kilowatt to \$5,000 per kilowatt, while the cost of wind power has fallen from \$2,000 to \$800 per kilowatt. It is cheaper still to generate electricity by saving

electricity through more efficient light bulbs, appliances and other devices.

Hereditary Problems

Nuclear proponents are now trying to light a new flame - a generation of "inherently safe" reactors intended to be impervious to meltdowns. Lawmakers under pressure to come up with alternatives to fossil fuel plants that cause air pollution and global warming are being lobbied to fund a rebirth of nuclear industry.

Today's light water plants have obvious inadequacies that the new plants would supposedly rectify. Three major alternatives, each intended to avoid the possibility of a TMI-type accident, are gaining attention. One is a modified light water reactor that differs from the current design mainly in having a larger and cooler core. This design still relies on elaborate redundant safety systems. The "PIUS" reactor being promoted by Swedish scientists is a sharp departure from present day designs. The core is to be housed in a pool of water containing boric acid that would automatically flood the core and cool it in case of an accident.

The third design is the high temperature gas cooled reactor. This has a very different type of core, with the uranium encased in billions of tiny ceramic spheres that limit the potential heat buildup. Fission automatically stops of its own accord if the core overheats. Such a system would work only if the reactor were restricted to about 100 megawatts - one tenth the size of today's plants.

While each of these designs has its advantages, none is free from potential problems. Meltdowns are not the only kinds of nuclear accidents. Reactors can also be subject to hydrogen explosions (one of the fears at TMI) or a runaway reaction, as at Chernobyl.

The misfortunes of the entire nuclear industry show that engineers' best intentions and detailed calculations do not ensure reliability. Indeed, the concept of "inherent safety" may be an engineering mirage, implying a degree of certainty and flawlessness

that is beyond the scope of foreseeable nuclear technologies.

More Nuclear Boondoggles?

The current hope of the nuclear advocates is to have the government fund the construction of a demonstration reactor, perhaps under the auspices of the nuclear weapons programme. However, the government has an abysmal record in managing large nuclear projects, including the decaying U.S. nuclear weapons complex, which will cost upward of \$100 billion to clean up during the next 20 years. Another is the Clinch River Breeder Reactor, which was a managerial disaster that cost \$1.5 billion before being stopped by the Congress in 1984. A uranium enrichment plant in Ohio begun in 1977 was abandoned in 1985 after \$3.5 billion went down the drain. That blunder alone wasted more money than the U.S. government has spent on all renewable energy R&D during the past decade.

Safer Alternatives

A nuclear revival would at best be a slow endeavour. A demonstration plant would take a decade to build and to prove itself reliable. It would take another decade before commercial reactors begin to come on line, and a third before there was enough nuclear power to supply significant energy. Energy efficiency by contrast, could make large contributions in a matter of months and renewable energy sources in a few years.

Today in the U.S., nuclear R&D spending is nearly five times that of spending on energy efficiency and nearly six times that on renewable energy - both of which are not only indisputably safe but far more likely to stop global warming before it seriously affects the planet.

Alternatives such as energy efficiency and some renewables are already cheaper than current nuclear plants, and, most likely, any "new generation". Non-nuclear energy sources are the only ones that can be honestly termed "inherently safe". Moreover they will not take 30 years to come on line,

and will never create a symbol as powerfully negative as the cooling towers looming over Three Mile Island. Source: Christopher Flavin, World.Watch

Hotspots Galore

A recent United States General Accounting Office (GAO) - (an office similar in purpose to our CAG) - report has found severe radioactive contamination at nine nuclear sites, all of which had supposedly been decommissioned. Three of the sites had been released for unrestricted use. At five sites, radioactive waste had been buried, but nobody knew the type or the amount of waste buried. Records were incomplete or non-existent.

According to GAO, "...all five sites have groundwater contamination levels higher than federal drinking water standards allow." One site, Kerr-HcGee's Cimarron uranium enrichment facility - most famous as the plant where Karen Silkwood worked - had groundwater contamination 400 times the standards. Another site in Erwin, Tennessee has contamination 730 times the federal drinking water standards.

In all, the GAO looked at nine sites. All had various levels of contamination. The problems at the U.S. Department of Energy's 17 nuclear weapon's plants are now well known. Although, no single civilian site may be as contaminated as the weapon's sites, there are far more civilian radiation users, including 112 reactors plus several already shut down, 22 fuel cycle facilities, 54 research reactors, and 23,000 other licensed users of radioactive materials.

If only one percent of these sites turn out to have contamination problems, the clean up cost will dwarf the tens of billions of dollars estimated to be necessary for the cleanup of the weapon's plants. With the GAO finding severe contamination problems at all nine of the sites it examined, the outlook is not promising.

The Nuclear Monitor 21.3.'89

Daring the last two years we have made special efforts to link with other kindred groups through exchanges of information and literature. As a result we nowadays got a large number of papers and journals not normally easily available in India. Beginning with this issue we intend to have a regular column to introduce/review different magazines, books etc. so that you too can have access to this world of information.



On September 1st, 1939 as German tanks started rumbling towards Poland, heralding the beginning of the most destructive war yet in human history, the first issue of Peace News hit the stands. Ever since 2,316 more have come out with the objective of bringing about non-violent revolution. In their own words:

"The nuclear arms race must be opposed. But it is only an extreme form of violence which is inherent in our society. Its other manifestations include sexism, racism, war, brutality, hunger, inequality and the exploitation of people animals and the environment.

Peace News seeks to oppose all forms of violence, and to create positive change based on co-operation and responsibility. 'To create a non-violent world, we must avoid violence in our struggle for change, since aims and means cannot be separated. The concept of non-violent revolution draws on the traditions of pacifism, anarchism, feminism, human rights, animal liberation, socialism and green politics.

We believe in breaking down hierarchies and demystifying skills. Peace News is produced by an editorial

collective independent of any organisation. It is non-profit making and depends on its survival on the generous support of its readers."

EXTRACT

If everything goes according to plan a small group of American businessmen will become millionaires by collecting rubbish. And a group of Pacific Islanders will, for the second time in the last forty years become guinea-pigs for American poisons.

It's in the best tradition of Western free enterprise. Having polluted their own environment to the point where an outraged American public has forced health and safety standards on waste dumps, American industrialists and local governments are glad to find an alternative. The newly formed Admiralty Pacific company (AP) hopes to make \$23 million profit in 1991 and \$77 million profit per year from 1994 on.

With 7,000,000 tons arriving annually from 1994 on, the Marshalls will get \$56 million per year - more than the annual budget of this Micronesian archipelago, where 43,000 people live on only 73 square miles of land.

Although it sounds innocuous, "household garbage" is laced with toxic wastes. Just the five years worth includes more than 125 million pounds of hazardous material, much of which will leach into the surrounding environment - the scarce fresh water aquifer and the Pacific Ocean. Even AP's President Dan Fleming admits that "there is no such thing as non-toxic, non-hazardous garbage."

Although there is significant Marshallese opposition to the plan, many local people support it. Senator Tony DeBrum who has led the Marshallese opposition says, "We have had to suffer the brunt of nuclear testing. We have had enough of American garbage out here. It is one thing to do something out of ignorance and fear, but to do it again for money would be inexcusable."

Peace News: 1.9.'39.

LETTER BOX

It was good to receive the last two issues of Anumukti after the prolonged gap. The attempts of the DAE to steam-roller all opposition to nuclear projects by repeatedly asserting the same semi-truths and falsehoods are by now a familiar experience. With Doordarshan in the hands of the government, it sometimes seems a hopelessly uphill task to make heard the voice of concerned dissent. I am referring to an edition of the Doordarshan's "FOCUS", aired of July 30th (I think !) where the so-called discussion on nuclear power was merely an opportunity for Dr.M.R. Srinivasan and others who are already deeply committed to nuclear energy to put forward the establishment's views. Shashi Kumar as moderator, questioned the wisdom of establishing nuclear plants very diffidently and apologetically - more as a matter of form than as any genuine argument against these plants. However, since Doordarshan's bias is by now fairly obvious and its credibility low; such exercises are not unduly worrisome on their own.

What saddened me, was the conviction with which some youngsters towed the DAE line at an inter-collegiate debate on the subject. This debate was held to mark Hiroshima day, by the "Young Hen's Christian Association". Those who spoke for the establishment seemed entirely convinced of the truthfulness, wisdom and sensibility of the pronuclear energy strategy. The danger according to me lies not so much in believing unquestioningly what the nuclear barons say, but in considering dissenters as a bunch of irresponsible, frightened dreamers whose patriotism is questionable. In fact as you rightly pointed out in an earlier issue of Anumukti there seems to be no communication of ideas between the two groups. That every one of the arguments in favour of nuclear energy is at least questionable seems to be outside the perception of the nuclear energy lobbyists.

Then there was this most

frightening aspect of the debate: youngsters calmly arguing that India needs to keep up its nuclear programmes in order to develop a nuclear weapons capability. If anyone doubted the hypocrisy of the government's statement that our nuclear energy programmes are purely peaceful, they should have heard these students. Obviously they have read between the lines very well and then merely stated the 'unacknowledged but very real corollary to our allegedly peaceful plans.

Let me quote from a report on the "Agni" missile published in the June 15th issue of India Today, to show that it does not take very much to put two and two together - "... with the Pokharan explosion, of 1974 India had demonstrated its ability to make a nuclear bomb. In 1980, the SLV-3 rocket launched the country into the space age. All that was missing was the vital third leg of the strategic triangle - a potent medium range ballistic missile capable of carrying a warhead over long distances." Of course "Agni" has been; successfully launched and the gap covered. To quote further, "Agni can also act as delivery system for a nuclear warhead with its destructive potential, with plutonium production in India's nuclear reactors and a number of Agni missiles deployed at strategic sites, India's deterrence factor is multiplied enormously."

Glory, glory, hallelujah, India is a superpower at last! Brothers in Pakistan beware, we could annihilate you and ourselves too in the bargain.

I am truly ashamed to find our nation being called a superpower. The connotations are entirely negative. Does it matter nothing if another million babies die miserable deaths from poverty and poor sanitation, or if a thriving people are reduced to beggary, as long as our missile bases are established and our scientists can boast of their ability to create weapons of mass destruction? Truly has Gandhi been murdered in the land of his birth !

Indira Vijaysimha
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R.T.Nagar, Bangalore 560032

A few points that emerged during and after a meeting with Dr. Dharendra Sharma on August.14th here in Bangalore.

1. Dr. Sharma asked that we all support Anumukti and request you for the price of bulk mailing. It was found that many of us speak to different audiences all the time and when we leave we just hand out a folder or two and there is very little follow-up. The decision was that some of us could receive Anumukti in bulk and distribute it.

2. We all seemed to be in agreement that there should be a regular column of news from Kaiga in Anumukti.

3. Some of us felt that Anumukti should be based on the WISE format and should not carry lengthy articles or reviews - which some of us may already be aware of or have access to.

Hemachandra Bassappa
for CANE group
21, Railway Parallel Road,
Nehru Nagar, Bangalore

Your effort is praiseworthy, though it involves a lot of pains. In my view Anumukti should be strengthened at the national level. CANE as well as friends from Bombay should pitch in and help you with this work. But at the same time you should be prepared to 'row the lonely furrow'

I believe that long articles are read by very few people. Thousand words should be the upper limit for an article. Calcutta Convention (Anumukti Vol.2 No.G June '09) deserved a bigger coverage.

Recently India Today's Newstrack (10.6.'89) has a very good video clip on Narora. It is of 20 minutes duration and is the result of the efforts of Shri Shanturn Seth.

Dhirendra Sharma
M-120, Greater Kailash II
New Delhi 110048

My name is Keiko Dekai. Rev.K.Yoda is a friend of my husband. I heard about your anti-nuclear movements in India from Rev. Yoda. He told us, you want some contact to Japanese who studying nuclear power plants. We've got shock when Rev.Yoda told us India starts to

built nuclear power plant in 'Orissa.

Orissa is one of a most holy place, because Ashoka stopped violence, because Gandhi Jee walked to Puri. Why nuclear power plant in Orissa !! I really expect you are getting more and more power.

Anyway, my English is not good, so I can't give you information exactly, what Japanese movements going on, I send you "Nuke Info Tokyo". I think you better contact to this paper.

I also send you "Is It Too Late?" Many Japanese read this book, then they change them mind, and stand up to stop the nuclear power plants.

Nukes, No!! Why people can 'be stupid. People must be stady. I wish your beautifful future.

Na Mu Myo Ho Ren Ge Kyo
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Apologising again and again for not sticking to the scheduled date of publication is disgraceful. Why can't you publish on time? Others do.

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A JOURNAL DEVOTED TO

When I decided to give up a career in physics and take to full time antinuclear activism, many of my physicist friends were sceptical. Not that my career was any great shakes, but still it did provide the daily bread. "All that you really need to do is to take a few months off and write down clearly all the arguments against nuclear power and then convince the policy makers about them. After all what you are saying is not something radically new. Other countries are in the process of abandoning nuclear power and anybody reasonable can see the force of these arguments", so went their plea.

No doubt, physicists are somewhat naive when it comes to predicting the 'real world'. But to-day, four years later, even my friends are convinced that it is not mere sweet reasonableness which is going to drive out nuclear power or any other anti-people technology from this land. Is *Anumukti* then doomed to failure? A battle for a cause already lost!

No, because there is a language that policy makers do understand—the language of organised mass protest. And it is heartening to see that protest is beginning to bloom everywhere. In Eastern Europe it has blossomed like a desert flower after rains. Old, long hidden, skeletons have come tumbling out of nuclear cupboards as freedom, the right to know, accountability of public officials, become the key words in the new order. It seems increasingly likely that nuclear power has no future in that part of the world. Already a number of projects have been postponed, cancelled or abandoned unfinished as a direct result of public agitation.

At home too, people are becoming aware of the fact that without protest, survival itself becomes difficult. It is a hopeful sign that activists in Kerala have already started organising in response to the nuclear lobby's Interest in the State. The victory at Kothamangalam needs an encore. But what is especially encouraging is the fact that even at Rawatbhata in Rajasthan—the site of India's first CANDU reactors—that people have realised the false promise of the nuclear future. The moment of waking heralds a new dawn.

Kakrapar to Rawatbhata Cycle Yatra

Sampurna Kranti Vidyalaya, Vedchhi is organising a cycle rally from Kakrapar to Rawatbhata to commemorate Chernobyl accident and as a mark of protest against the continued government support to antipeople nuclear policies. The rally which would commence on April 10th, would mainly pass through adivasi lands of Gujarat and Madhya Pradesh and reach Rawatbhata on April 24th in time for the antinuclear convention being organised there. On the way there would be a large number of small public meetings at which participants would try to raise public consciousness on the nuclear and other 'development' issues. Attempts would be made to make contacts with individuals and small grass-roots groups so that an effective organisation can be built for the future.

The rally will focus attention on four main themes:

(1) Nuclear energy has proved to be neither safe nor clean nor cheap. Recent findings in other countries (BEIR V-report, Sellafield leukaemia clusters, privatisation fiasco in U.K. etc) just show that nuclear energy is an even bigger failure than was apparent even a few years back.

(2) Although the rationale behind installation of a nuclear facility is local development - it is precisely

the 'locals' who don't develop. Thus, even after 17 years of an operating reactor and almost 30 years after the decision to build the plant was taken, people who live in villages surrounding Rawatbhata Atomic Power Plant (RAPP) have yet to receive electricity, drinking water or basic emergency medical services from the plant.

(3) Big dams - besides causing large scale environmental degradation themselves - are precursors of atomic power projects. This has happened at both Rawatbhata (Rana Pratap Sagar dam on river Chambal) and Kakrapar (Ukai dam on river Tapi). The new proposed dams on the Narmada too - despite all protestations regarding fulfilling the drinking water needs of thirsty people of Kutch and Saurashtra - would no doubt be strong attractors for a future nuclear power plant.

(4) All over the world nuclear power has paid special 'attention' to indigenous populations. Whether it is uranium mining, or location of nuclear installations or nuclear weapons (peaceful nuclear device) testing, it is the indigenous people who bear the greatest risk and get the least benefit. The route of the rally lies mostly through adivasi land to highlight this injustice.

Singing a New Tune

A report by the National Research Council of the US National Academy of Sciences (NAS) has concluded that the risk of exposure to low levels of radiation are at least four times — and in some cases, up to 14 times — greater than previously acknowledged by most radiation scientists. The long awaited *Biological Effects of Ionizing Radiation* (BEIR - V) report, released late last December, confirms the view held by dissident scientists. Mainly, that there is no safe dose of radiation and that the risk of radiation exposure follows a linear model. The report's findings are expected to lead to new standards for workers in the nuclear industry worldwide.

In 1980, the Academy's *BEIR-III* report had adopted a "linear- quadratic model", which presumed that low levels of radiation offered little to no risk. BEIR-V report is based on more recent data about the amount of radiation released by the atomic bombs dropped on Hiroshima and Nagasaki, which was considerably less than previously believed, and

also on the fact that bomb survivors are developing cancers at much higher rates than projected by *BEIR-III*. The report is a step in the direction of vindication of such antinuclear pioneers as Drs. Rosalie Bertell, Alice Stewart, Irwin Bross, Thomas Mancuso, John Goffman, Earnest Sternglass, the late Karl Z Morgan and many others much of whose work had previously been ignored or ridiculed by the nuclear establishment.

Using new information the report concludes that the risk for solid tumour cancer is three times greater than previously believed while the risk for leukemia is four times greater. The report also found a much greater risk of mental retardation among unborn babies exposed to low level radiation during the eighth to fifteenth weeks after conception. The report found that women are slightly more likely than men to develop cancers from low levels of radiation and that in some type of cancers, children are more susceptible than adults.

The BEIR-V report also concluded that normal background radiation poses a cancer risk up to 14 times higher than acknowledged in BEIR-III. According to the report, between 520 and 600 fatal cancers will be caused by lifetime exposure of 100,000 persons to 100 millirems annually - an average background dose. BEIR-III had predicted that only 25 to 119 fatal cancers would develop. However, BEIR-V only measured fatal cancers; the risk of developing non-fatal cancers is another 50% greater.

The panel was not charged with making public policy recommendations based on its conclusions and it did not attempt to do so. But Warren Sinclair, president of the US National Council for Radiological Protection, the panel which sets radiation exposure limits in the US, said that "present occupational limits will very likely be reduced" because of BEIR-V. There will most likely be an even more drastic reduction when a future BEIR-VI takes into account the recently released data on the

500,000 workers in the US Department of Energy's nuclear weapon's facilities.

Meanwhile Back Home....

The Atomic Energy Regulatory Board (AERB) has cautioned against the abnormal increase in the total radiation exposure at almost all nuclear establishments in the country. Prof. A.K. De chairman of AERB, said that the Board's Safety Review Committee had noticed that the total radiation exposure at nuclear power stations had gone up to 1,700 man-rem. It has asked the stations to bring the figure down to around 1,000 man-rem. Each individual should not be subjected to more than one rem of radiation. In 25% of the cases at Rawatbhata (RAPP) and Kalpakkam (MAPP), the reading had gone up to 2.5 rems. Recently RAPP was shut down for a few days as a result of increase in radiation in take.

Source: Indian Express 11.3.1990

Conscripts Construct CANDUs

The world knows that the regime in Romania led by the late Nicolae Ceausescu was founded on brutal repression and routine violations of human rights. Since Ceausescu's execution, it has also become clear that Canadians played a role in that repressive regime through the deals made by Canadian government agencies to build CANDU nuclear reactors in Romania. Forced labour has

been reported on the construction of Canadian CANDU reactors in Romania, and Canadian External Affairs officials admitted that they had previously received reports of conscripted labour being used at the nuclear megaproject. It seems that "commercial considerations caused countries such as Canada to overlook Ceausescu's villainy."

Canada began negotiating the sale of these

reactors in 1967. By 1977, Canada was reported to be close to an agreement with Romania for the construction of up to sixteen reactors. That same year, Canada and Romania signed a nuclear cooperation treaty that included nuclear weapon non-proliferation safeguards. In July 78, an agreement was signed covering the engineering services for one reactor, and by October that year, Atomic Energy of Canada Ltd. (AECL) announced that Romania



had agreed to buy two reactors and most of the heavy water needed to run them. In August '83 construction on two reactors began at Cernavoda, a small city on the Danube River, close to the Black Sea.

In retrospect, barter trade arrangements, negotiated to allow Romania to pay for reactor parts without currency, may have contributed both to the hardships that Romanian workers have endured, and to predictable financial losses for certain Canadian manufacturing industries. While most Romanians were chronically short of clothing and food, and living in dwellings with only minimal heat, Romania was exporting millions of dollars worth of garments and food products to Canada. These goods were apparently sold at bargain prices across Canada, thus undercutting comparable Canadian-made items. Romanian plate steel, imported under the same conditions, is reported to have cost Canadian steel companies in excess of \$10 million in lost sales. Most Canadian nuclear suppliers, with the exception of AECL, took 100% counter-trade on all their sales to Romania. Romanian steel plates that were part of the trade deal eventually became subject to Canadian dumping tariffs.

An independent study of AECL's commercial transactions, published in 1987 by the Economic Council of Canada, confirms that the crown corporation's export history has not been profitable. It was estimated at that time, that AECL had cost federal taxpayers \$12 billion (1981 currency) since its inception. Clearly, AECL's difficulties in selling

CANDU reactors abroad, and the Canadian nuclear industry's fears of financial collapse were prime factors in this highly questionable deal with Romania. Unfortunately, the Romanian workers, upon whose industrial production the deal was founded, were a captive and impoverished workforce. Canadian officials did not let the prospect of Romanian deprivation affect their willingness to do business.

The deal with Romania covered not only the construction of nuclear reactors, but also the transfer of nuclear technology, and the proposed sale of heavy water. At each successive stage, this deal brought Romania closer to having the capacity to produce nuclear weapons. As Romania became increasingly unstable in the 1980s, the risk this deal posed to international security should have been clear to Canadians. Concern was highlighted in 1985, when AECL signed an agreement that gave Romania the right to re-sell CANDU components to other countries, thus increasing the risks of horizontal nuclear proliferation. With Romania now in a politically volatile state, it is difficult to predict whether construction on the CANDU station will continue and if non-proliferation agreements will be adhered to by the new Romanian government. The Romanian election, to be held in May, will no doubt bring more news about whether construction of the five reactors at Cernavoda will continue or not.

Rod MacLeod

Nuclear Awareness News Winter 1989/1990

Chernobyl— The Sad Saga Continues

Between 1987 and 1989, a further 150,000 people (in addition to the 135,000 people evacuated at the time of the accident) were evacuated from contaminated areas in the Soviet Union. They had accumulated high doses of radiation through continued exposure to the fallout from the 1986 disaster. Another hundred thousand more people can expect evacuation between 1990-1992, when they approach the already too high emergency permissible radiation limit. At least 60,000 people mainly young persons and professionals have already left the areas without waiting for compensation or official resettlement. More than 220 villages have been already abandoned and some 600 villages and towns were included in a programme of systematic decontamination.

In 1989, it was officially acknowledged that an area of about 10,000 square kilometres in various parts of the Ukraine, Byelorussia and the Russian SSR was contaminated with cesium-137 to levels

higher than 40 Ci/square km and was considered dangerous for human habitation. About 150 villages are now waiting for the next wave of evacuation. In some still inhabited "hot-spots", levels of radioactive cesium as high as 90 — 140 Ci/square km have been found. The local population, particularly children are already suffering adverse health effects.

A significant part of the heavily contaminated area is far from the reactor site - in some cases between 100 and 400 kilometres away. High contamination was caused due to the fact that it rained on these areas during the time the damaged reactor was belching out radioactivity. Levels of cesium-137 between 15 and 40 Ci/square km were recorded over some 22,000 square kilometres during 1989. Western standards presently consider even 15 Ci/square km as unsuitable for agriculture, particularly livestock farming.

Some reports indicate that some 100,000 square kilometres of land in the European part of the Soviet Union has levels of cesium-137 and strontium-90 higher than 50,000 Bq/square metre. However, these rural areas and even those with contamination levels above 500,000 Bq/square metre, continue to be farmed although the agricultural produce from there is required to undergo special treatment. According to the regulations, livestock must be transferred to clean feeding about two months before slaughter. Milk is used only to make butter and cheese. But because of food shortages, violations

of the rules are common.

Approximately one million people live in areas now designated as "permanent strict radiation control" areas. The Ministry of Health has raised the maximum permissible limit of radiation dosage in these areas far above internationally recommended limits.

Sources: The Environmental Destruction of the Soviet Union" Zhores Medvedev The Ecologist Vol.20 No. 1 January 1990.

Rawatbhata : Development Brings Dissatisfaction

Rawatbhata near Kota in Rajasthan is being made into a large centre of nuclear generated electricity. The construction of the first reactor started in the sixties and by late 1973 the reactor had begun commercial production. The second unit commenced production on 1st April, 1981. Construction of the third and fourth unit has already begun and four more units are proposed. All these units are situated on the banks of the Rana Pratap Sagar dam reservoir. Within a 100 km distance three other dams have been built on the Chambal - the Gandhi Sagar dam, the Jawahar Sagar dam and the Kota barrage which together form the Chambal valley plan. All the dams produce hydroelectricity besides providing water for irrigation through a network of canals. On the top of this there is a thermal power station in Kota. A number of large industries have already started functioning there. One would expect that with so many 'temples' of modern development all concentrated in one place, the people of this region would be contented, happy and staunch supporters of the 'development' process. In fact before reaching Rawatbhata this is precisely the impression one gets - where once there was a jungle in which tigers roared, today there are new and newer colonies, shopping centers coming up by the minute. New buses run up and down Rawatbhata's roads.

But on January 13th, 1990, there was a meeting in Rawatbhata where an absolutely contrary picture emerged. This meeting had been called to discuss the benefits and the harm caused by the local nuclear power plant. It was attended by the sarpanches of two other villages besides Rawatbhata, a number of locally elected officials, farmers, tradespeople, unemployed youth besides some representatives from outside. In the meeting it became obvious that local people share feelings of disappointment, anxiety and anger and they feel that all these reactors, industries and dams have been of

no use to them.

The meeting was chaired by Shri Kishanlal Gupta the former chairman of Bhaisroad Panchayat and a resident of Eklingpura village. He said that the area was once a very good jungle and pasture land from which the local residents got various kinds of fruits, roots, leaves, wood, cattlefeed and other produce. The tornado of development has laid bare all this. The local residents have not benefited at all. Even today, most neighbouring villages do not yet have proper roads so that in an emergency the villagers could be taken elsewhere in a hurry. Although Rawatbhata is such a major electricity generating centre and supplies electricity to all parts of the northern grid, but the local farmers are still pining for electricity connections. He mentioned instances of farmers whose applications for electricity connections were still pending after ten years. In the same vein, the Rawatbhata village panchayat chairman Shri Ratanlal Gupta said, "The village Tamlav situated right next to the reactors is yet to receive electricity". There are also villages in the area where drinking water is still a serious problem and the water has to be carried in tankers during the summers.

Another fact which was illuminated during the discussions at the meeting was the discrimination practiced by the RAPP authorities between their own employees and the local population in matters relating to basic facilities. The local people have great difficulty in getting tap water connections. Even in cases of severe emergency, local people are not treated in the hospital attached to the power plant. This, despite the fact that there is no other hospital in the vicinity. In fact the government ought to set up a special hospital and health centres to deal with the damage caused by the radioactive pollution of the nuclear power plant. Even the suez of the colony of employees of RAPP is allowed to flow freely through the localities posing a grave health

risk. The Rawatbhata village panchayat has drawn the attention of the authorities many times to these problems through correspondence and only received empty reassurances in return.

Expectations regarding jobs and other employment opportunities are naturally aroused in the neighbouring villages the moment a large project is announced. But most of the jobs go to the well educated from the cities and metropolis while only manual work is left for the local people. The same has happened in Rawatbhata. The unemployed youth in Rawatbhata have organised themselves into a union which has raised the demand of local employment. Two days before the meeting they had carried out a 'Rasta-roko' agitation. The chairman of the union Shri Rajesh Singh Rajora told the meeting in very clear terms, "We do not want any new reactors here - they are of no use to us."

There is a great deal of anxiety amongst the local population regarding radiation hazards of nuclear power plants. The disasters of Bhopal and Chernobyl are particularly to the fore in peoples minds. There is no information regarding what kind and amount of damage an accident can cause; what to do in the event of an accident; what are the possibilities of an accident at Rawatbhata; what are the emergency plans of the authorities etc. On none of these points have the authorities been forthcoming with information. About one and a half years ago an exercise was carried out to test emergency preparedness. However, since the authorities have always maintained that an accident was impossible, the local residents wonder why the need to have emergency preparedness drills. Last September there was a gas leak in the heavy water plant which caused a great deal of panic in the area. The security guards and the employees had decamped wearing masks in trucks. The residents of Tamlao village had also felt the smell of the gas. But the authorities have tried to cover-up this incident calling it a rumour. Due to this their credibility has reduced greatly. Any criticism of the atomic energy programme is labelled by the authorities as the work of foreign inspired people who want to weaken the country. There was a consensus at the meeting that the authorities have no other excuses left to offer. Ratna Mathur, who had come from Delhi said that the reality was just the opposite. Prosperous countries are cutting back on their nuclear programmes under the pressure of public opinion generated by Chernobyl. Hence there is a maximum pressure from

A "Parmanu Pradooshan Sangharsh Samiti" to fight against the radiation pollution caused by nuclear power plants both operating and proposed in the Rawatbhata area has been formed. The samiti has decided to commemorate Chernobyl day by calling a two day convention on April 25th and 26th, We invite friends and workers from other regions to come and join us. There are regular buses every hour from Kota to Rawatbhata starting from Gumanpura bus-stand between 7 A.M. and 10 P.M.

Contact: Shri Ratanlal Gupta — Sarpanch Rawatbhata Panchayat.

them on the Third World nations to accept the useless technology, hardware, instruments, etc. which they want to dump.

Authorities also claim that whatever the dangers involved, electricity is necessary for progress. But as one person said in the meeting, "There can be no development at the cost of human life." Rajeev Singh from Delhi clarified that the restart of Rawatbhata Unit 1 after there was a crack in the end-shield was not an achievement to be proud of but rather a crime against humanity considering the risk involved. Nowhere else in the world is a reactor with a crack in its end shield being operated. Sunil from Hoshangabad said that nobody could believe the authorities. They are going ahead with their programme despite growing protests only because their vested selfish interests are involved. They do not consider the local population any better than insects and treat them accordingly.

The slowly gathering storm of protest in Rawatbhata is about to break. The authorities of RAPP have started following a carrot and stick policy of simultaneously giving concessions and suppressing dissent. They have promised to make a junior college in Rawatbhata village. Shri Ratanlal Gupta, the Rawatbhata village sarpanch said that there was a proposal to supersede the village panchayat along with panchayats of another two villages and to incorporate them into a special development authority whose control would be exercised by a government appointed administrator. This way, the protest voiced by locally elected village officials could be silenced.

The meeting ended by forming a struggle council (sangharsh samiti). The samiti has decided to collect information on this issue and has called a conference on 25th and 26th of April, at Rawatbhata for this purpose. They want to establish a dialogue with other struggle movements and have invited representatives to come to the conference.

There is no doubt that modern development projects are raising anxieties and fears amongst the people not only at Rawatbhata. It is also apparent that the high priests of development have no answer to calm these fears.

(Translated from Hindi)

Sunil

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Radiation Kills Children of Nuclear Workers

An alarming UK study linking childhood leukaemia to fathers exposed to radiation has created furor in Great Britain and elsewhere. (See Box) The study found that children living in Seascale, a village near the Sellafield nuclear reprocessing plant, were ten times more likely to suffer from leukaemia than children in the general population; one in five of the children with the disease studied had fathers who worked at the plant. The study, led by Professor Martin Gardner of Southampton University on behalf of the British Medical Association (BMA), was published in the *British Medical Journal* on 16th February, and was picked up immediately by the British media, making the front page of virtually every daily coming out of Britain and prompting calls for action.

The BMA study found an unusually high incidence of leukaemia among children living near the Sellafield plant in Cumbria, in the northwest of Britain, and provides the strongest link yet between leukaemia clusters with nuclear power facilities. Media reports are calling it the first study of its kind in the world, but in fact it is the latest in a long line of studies (most of which have so far been ignored) that show that radiation is

Results of case-control study of leukaemia and lymphoma among young people near Sellafield nuclear plant in West Cumbria.

Results : Expected associations with prenatal exposure to x rays were found, but little information was available on viral illnesses. Relative risks for leukaemia and non-Hodgkin's lymphoma were higher in children born near Sellafield and in children of fathers employed at the plant, particularly those with high radiation dose recordings before their child's conception. For example, the relative risks compared with area controls were 0.17 (95% confidence interval 0.05 to 0.53) for being born further than 5 km from Sellafield, 2.44 (1.04 to 5.71) for children of fathers employed at Sellafield at their conception, and 6.42 (1.57 to 26.3) for children of fathers receiving a total preconceptional ionising radiation dose of 100 mSv or more. Other factors, including exposure to x rays, maternal age, employment elsewhere, eating seafood, and playing on the beach did not explain these relationships. Focusing on Seascale, where the excess incidence has predominantly been reported, showed for the four out of five cases of leukaemia and one case of non-Hodgkin's lymphoma whose fathers were employed at Sellafield and for whom dose information was obtained, that the fathers of each case had higher radiation doses before their child's conception than all their matched control fathers; the father of the other Seascale case (non-Hodgkin's lymphoma) was not employed at the plant. These results seem to explain statistically the geographical and employment associations with Sellafield that were found.

Conclusions : The raised incidence of leukaemia, particularly, and non-Hodgkin's lymphoma among children near Sellafield was associated with paternal employment and recorded external dose of whole body penetrating radiation during work at the plant before conception. The association can explain statistically the observed geographical excess. This result suggests an effect of ionising radiation on fathers that may be leukaemogenic in their offspring, though other, less likely, explanations are possible. There are important potential implications for radiobiology and for protection of radiation workers and their children.

British Medical Journal 17 February 1990

considerably more dangerous than what was assumed when the current safety standards were set. Where it differs from most other studies, though, is in the genetic implications: The study suggests that radiation at Sellafield effected the sperm of men working there, possibly introducing a genetic mutation. It found that where workers received only 10 mSv in the six months prior to conception, their children also faced a 6-8 fold increase in risk of developing leukaemia. (The current annual dose limit is 50 mSv). It is not, however, the first time that damage to sperm has been linked to radiation. For example, according to Greenpeace, genetic implications of radioactive exposure on nuclear submarines were revealed in a study which showed that between 1972 and 1975 four babies born to submarines on the Polaris submarine HMS Resolution were born with hare lip and cleft palate. In 1986 Dr. Maha Linet, then at Johns Hopkins University in Baltimore, looked at 309 cases of childhood leukaemia in Shanghai. She and her Chinese colleagues found that the disease was more common in the children of men who had diagnostic X-rays before conception than in those of men

who had not. The risk of cancer increased with the number of X-rays that the men had been given. Similarly the fifth report of the *Biological Effects of Ionising Radiation series* (See also "Singing a New Tune" page, this issue) describes Japanese research which shows that two out of the 1,630 women pregnant at the time of the atomic holocaust gave birth to children who subsequently contracted childhood cancers. Normally fewer than one in 1,630 would be expected.

The scientists in the BMA study found that of 52 local children who had leukaemia between 1950 and 1985, 10 had fathers who worked at Sellafield. The link was strongest where the father had received particularly high doses of radiation before the child's conception. Scientists and engineers at British Nuclear Fuels (BNFL), which runs the Sellafield plant expressed "deep concern" and called for urgent action to reduce radiation dose limits for employees. At the same time, however, BNFL said that while the report came from a "respectable source", it did not believe it established a link between radioactive discharges from the plant and childhood leukaemia.

Workers at Sellafield were told about the findings before they left work on the day before the study hit the front pages. Shop stewards began considering their response that night, but already the Transport and General Workers Union, on behalf of the industrial unions in the nuclear industry, a/e calling for urgent action. On March 6th three families, in which the father works at Sellafield and the children have cancer, served writs on British Nuclear Fuels as a result of this study. Martyn Day, solicitor for families claiming that their children were

made ill by radiation, said that already half the children involved were dead. Susan D'Arcy believes that her daughter's leukaemia is directly linked to the Sellafield plant. Her daughter Gemma, is one of the three children in one school to have contracted the cancer in the last two years. The other two children died. Gemma who is six years old, is at present in hospital following a bone-marrow transplant. Gemma's father, Stephen D'Arcy, has refused to support his wife's test case against BNFL saying, "It's a bit like biting the hand that feeds you." BNFL employs around 33% of the population of the area. At Sellafield alone, there are some 14,000 people working at the plant, and thousands more depend on it for a living.

In a follow-up story on the study on Sunday after it was released, *The Guardian* ran a headline saying "Cumbrians Calm on Sellafield Report". But the article itself contradicted this. One person interviewed, Christopher Merlin, who had already begun a lawsuit against BNFL after plutonium from the plant was found in his household dust, predicted it would have a "disturbing effect on marriages in the area." Another man said, "I would be worried if I were starting a family. I've worked there for four years." Even a woman who said, "yes, people were taking it calmly and there was," she thought, "no panic", went on to add, "Yet I think young people are bound to think twice about whether there is any risk." Let's hope the authorities who set dose limits think twice, too.

Source: WISE News Communique 326
The Economist March 10, 1990
Peace News February 23, 1990

The discovery of a clear statistical link between the exposure of men to excessive radiation and leukaemia in their children is a calamity of dreadful proportions for those directly affected. The anguish of a father of a child suffering from this serious and sometimes fatal disease will be increased immeasurably by the suspicion that the origin of such suffering may after all be in himself. Such families need and deserve all the support and sympathy a compassionate society can muster. So serious are the implications of this discovery that the only sound basis for public policy in response must be to act as if the suspicion was already proved. Further research is essential, but it must not be used as an excuse for delay. The investigation by Professor Martin Gardner of Southampton University is evidence enough for action. It is already being hailed as a model of its kind, and may become a classical demonstration of the detective power of environmental epidemiology, the science of investigating statistical patterns of disease in pursuit of clues to medical causes and effects.

The implication must be faced, painful though it is, that any man who has been exposed regularly to radiation in the course of his employment may run some risk of fathering children who may eventually contract leukaemia. One of the first priorities of research must be to identify that group at risk as accurately as possible, for there must be thousands of men whose work brings them into contact with radiation who will today be fearful about their own families. They need reassurance as fast as it can be obtained, based on solid scientific investigation. Meanwhile the entire nuclear industry is faced with a real emergency. Radiation safety levels will have to be reviewed once again, and almost certainly substantially lowered. This is also a case where it will be not sufficient to await the final dotted T or crossed T in the laboratory, but where the only right basis to proceed for the time being will be to assume the worst.

The Times (London) 16.2.1990

Events

Talk by Dr Rosalie Berteli

On 28th February, 1990 a lecture on the "Health Hazards of Low Level Radiation" by Dr Rosalie Berteli was organised in the Indian Merchants Chamber Hall in Bombay. The organiser was F.I.A.M.C. Bio-Medical Ethics Centre of Bombay. The lecture was co-sponsored by a number of organisations including *Anumukti*. Dr Biswatu Banerjee a physicist from Tata Institute of Fundamental Research presided and Mr Justice Y. V. Chaudrachud - the former Chief Justice of India was the chief guest. The lecture was attended amongst others by many scientists, medical personnel and journalists.

Dr Rosalie Berteli who is the author of *No Immediate Danger — Prognosis for a Radio-active Earth* is a very famous figure in antinuclear circles all over the world. Two years ago she was awarded ^M"The Right Livelihood Award" — the "Alternative Nobel Prize" for her pioneering work on effects of low level nuclear radiation. She has been a fighter for human rights especially for the rights of the weak and the dispossessed. Trained originally as a statistician she presently is the President of the International Institute of Concern for Public Health. She has a special relationship with India since she is involved in a long-term study of the effects on the naturally occurring (high) low level radiation in the monazite sands of Kerala.

During her talk she sighted many studies in which she herself had been involved to stress the pernicious nature of low level radiation. The point she stressed was that increasing radiation pollution is a form of random murder. What we are actually doing is to deplete the strength of the gene-pool. In the long run we will be producing children who are less able to cope with pollution than were their parents while at the same time we're degrading the environment so that they have more to cope with.

Of special interest were her preliminary findings of the study of 40,000 fisherfolk and a comparable control group living on the sands in Kerala. She confirmed that there had been an increase of three to four times as much in congenital diseases like epilepsy, cleft lip and palate, infertility, Down's syndrome etc.

She also talked on the role of standard setting bodies like ICRP (International Council for Radiological Protection) which though they recognise the various ill effects on biological systems of

radiation like injuries, general lowering of W.B.C. counts, cataracts, obesity, impaired fertility, shortened lifespans, increases in cardio-vascular-renal diseases as well as in autoimmune lymphoid diseases; only take into consideration fatal tumours while setting standards.

Medicos Say No to Nuclear Energy

Medico Friend Circle (MFC) in its XVIth annual meet on "Radiation and Health" held at Gandhigram Rural University from 26th to 28th January resolved to oppose the production and use of nuclear energy as being too hazardous for the health of human beings and to demand that existing nuclear facilities be de-commissioned and no new nuclear plants be built.

The discussion in this meet was divided into four broad areas:

- 1) Basics of radiation and health and the experience of nuclear power plants;
- 2) Health-hazards of common radiological investigations;
- 3) Food irradiation;
- 4) Other sources of radiation from consumer products - Electronic Display screens for instance.

Most of the discussion and background material was focussed on the first area; a clear consensus also emerged.

During this discussion, it was pointed out that authorities all over the world have concluded that the quantum of radiation, how so ever small, invariably cause damage to human issues and that there is no level of radiation that can be considered safe. Production of nuclear energy damages the health of the people through exposure to ionising radiation at all stages of operation. Mining and milling, transport of radioactive material, burning of nuclear fuel in the reactors etc. cause radioactive contamination of the environment. There is enough scientific evidence to this end. Moreover what is of grave concern is the nature of the health hazards caused by ionising radiations which could to the foetus, genetic mutation after many generations and would be carried over to future generations as well.

The MFC meet underlines the special significance of these health hazards which would affect the very quality of human race in the future generations to come. Added to this is the predicted adverse effect on the power to resist infectious organisms and other stresses. These alarming health hazards

are reasons enough to outright reject nuclear power.

The participants of MFC meet emphasised that apart from these major health hazards, there are many other important health problems like increased incidence of allergies, asthma, high blood pressure, hypothyroidism, reduced fertility, spontaneous abortion etc. Thus on health grounds alone, nuclear energy is to be rejected in absolute terms with little need to base our judgement on the comparative analysis of health hazards of different sources of energy. Any source of energy which threatens the very survival and quality of human species has to be rejected and human society must find a model of development compatible with safe energy sources. During the course of the discussion it became clear that the health hazards of nuclear energy cannot be minimized despite claims to the contrary. Above all, the problem of safe disposal of radioactive waste for thousands of years has yet to be solved.

Today, nuclear energy constitutes only 1% of total electricity produced in India, shutting down of nuclear power plants will thus not result in a crisis on the energy front. The 1% deficit for which the nuclear energy is being produced can easily be overcome by saving electricity losses in transmission.

The MFC meet has also drawn attention to the health hazards of repeated exposure of pregnant women for prolonged periods to visual display terminals (Screens) attached to Computers.

The MFC meet, while affirming the well established immense value of radiological investigations has drawn attention to the fact that additional cancers do in fact occur due to exposure to X-rays. The incidence of additional cancers is extremely low and depends upon the age, sex of the person exposed and the quality of radiological apparatus. It has been estimated that in case of adult male persons exposed to these X-rays, there would be 15 additional cancers per million X-rays. Compared to the number of lives saved and diseases diagnosed this risk is extremely low. But nevertheless it follows that X-rays must be kept to as minimum as necessary and secondly all the precautions necessary to maintain the X-rays units properly have to be meticulously followed. On both these counts the situation in India especially in Taluka places etc., is much worse than in the developed countries. Screening machines are much more hazardous because their exposure is many times more and hence it should be restricted

to the absolute minimum. Atomic Energy Regulatory Board must exercise its powers to regulate the quality of radiology units.

War Resisters Meet

The regional conference of the War Resisters India (West) took place at the Sampurna Kranti Vidyalaya in Vedchhi between 10-13 March 1990. It unanimously adopted the following resolution:

"We the peace activists and constructive workers of the western part of India are deeply concerned about the increasing violence and militarisation in the subcontinent. We firmly believe that it is our responsibility to take such steps that would help in bringing about mutual understanding and peaceful relations between the peoples of this region. Our objective is a world without war, and it is with that spirit that we state the following:

"As the Indian government has repeatedly stated that it is committed to giving priority to friendly relations with her neighbours, we are disturbed to learn now that the Prime Minister has announced an increase in the defense budget whereas the general trend the world over is towards reduction of arms. Therefore, we urge our government to start cutting military expenditure in order to build confidence in South Asia."

"Some recent statements by the government referring to its intention to go to war if necessary as well as the appointment of a defense minister who is a strong protagonist of nuclear weapons are not in keeping with the spirit of the processed policy of reconciliation. This has only served to vitiate the atmosphere in the region.

"We welcome the announcement that at last the Indian troops will now be withdrawn from Sri Lanka and we hope that in future no action will be taken which may be considered a further interference in the affairs of Sri Lanka and for that matter any neighbour country. The future of the people of this region is closely linked with the availability of water. This should encourage the governments to find amicable solutions to water disputes, for example sharing of Ganga waters between India and Bangla Desh."

"We on our part attach the utmost importance to these issues and are determined to continue our struggle for peace and friendship with our neighbours. We hold that the future of India is linked with the future of her neighbours."

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A Passing Opportunity ?

Energy situation in the GDR and future possibilities

Times are changing rapidly in Eastern Europe. Today, policies regarding the future are no longer decided by a small group of rulers. The people have demanded their rights and soon in all Eastern European countries there will be elections. The tasks of the new governments in the fields of environment and economy will be hard.

The former government of the German Democratic Republic has left an economic and environmental disaster behind it.

In the south of the GDR lie brown coal deposits. It is the only raw material available in the country for energy production. The quarrying of this has destroyed the surrounding area completely. In 36 coal-mining districts 320 Mio tons are quarried per year. That is more than in any other country of the world. The cost to nature and to the population of the area are enormous: 3,000—4,000 ha dead landscape with huge craters is the result of one year's operations alone. 30,000 people have had to resettle, 75 villages have been exterminated, rivers, roads and railroads have had to give way before the gigantic quarrying machines.

70% of the energy supply in the GDR comes from this brown coal. In 16 mainly obsolete power stations more than 80 % of the delivery is burned. But the bigger part of this amount emits through the chimnies and polluts the environment. There are no dustfilters, no installations to cut the sulphur dioxide emissions.

Sebastian Pflugbeil, member of the opposition group "Neues Forum" and a physicist says that three quarter of these power stations should be pulled down because they are in such catastrophically bad repair. He points out that the GDR has the third highest energy consumption per head in the world - a consequence of the old techniques besides the waste of energy everywhere.

So, what to do? The intermediate government had recently made first attempts for a change and reduced the mining of brown coal by about 50-70 Mio tons. But this alone can not be the solution.

In the Federal Republic of Germany the nucleocrats and businessmen of the atomic industry are already on the stage hoping to sell a product which has seemed to be "out" in their own country. In the West it has become more and more difficult to install new atomic power plants: the raised awareness of the population, the opposition movement,

the Chernobyl-accident, the increasing costs of this energy resource have all led to a situation where no politician wants to take the risk of ordering new constructions. Now the atomic industry sees its chance in the East. Talks between nuclear experts in the GDR and the West German companies have already taken place.

Today, in the GDR at most 10% of the energy output comes from nuclear plants. Five reactors are on line, four of which are Soviet 440 MW reactors installed at Greifswald. Three others near Stendal are still under construction after 17 years. Recently it has become known that there was a near core meltdown at the new fifth block of Greifswald in November 1989 and a very severe accident in 1976 (see following story).

There has hardly been any resistance against the reactors in the GDR. The pressure from security forces and the ruling party was too strong and the existing environmental groups were faced with more evident abuses: air pollution, dirty rivers and destroyed environment. But if the new elected government decides to extend the nuclear programme there will be probably be more turmoil - the government has to calculate that the times of a quiet citizenry have passed.

It is ironical that just the members of the former government party SED got support of the conservative federal government of West Germany on this issue. In the case of atomic energy the old rulers seem to be the most reliable partners for the western enthusiasts of atomic power.

The common man in East Germany would perhaps prefer some radiation to the terribly bad air but for the environmentalists and most of the opposition groups in the country the choice between the alternatives "brown coal" or "atomic power" is like "the choice between plague and cholera".

The environmentalists have other ideas about future energy politics: they want to overhaul the existing brown coal power stations, improve the industrial and household techniques and put the main emphasis on energy saving possibilities. According to Mr Pflugbeil an extensive energy saving programme is the solution because the opportunities to save energy are more than good. Besides, the brown coal resources are becoming less and less, their quality becomes worse and the quarrying gets more difficult. On the other hand the construc-

tion of new nuclear power plants takes a long time (about 10-20 years) - too much time and too much money for an economy in difficulties. The huge expenditures which are necessary for the construction of atomic power plants would divert money from more sensible and urgent activities.

On the 18th of March the first free election in the GDR have taken place. The conservatives have

won. This means that the unification of Germany will be quickly forced. Whether the new government with the help of the conservative government in Bonn will be willing to start a reasonable energy policy without nuclear power plants is now again in question. But, the environmentalists too will unite. And they have the better arguments...

Carolyn Bender, Bonn, West-Germany

Notice Board

"Safe Energy and Environment"

A new quarterly journal "Safe Energy & Environment" will be coming up from April, 1990.

In Calcutta, a citizen's convention on April 30, 1989, to commemorate the Chernobyl Day, stressed the need for an organised effort for the collection and dissemination of information on the dangers of nuclear power and people's movement against it in particular, and environmental and energy issues in general. The journal 'Safe Energy and Environment' is a step towards the realisation of the demand of the convention. At present, we are working with a handful of activists, greatly limited resources and a tiny network. What we want to make is a modest beginning. The future depends on your active co-operation and support.

Yearly subscription rate:

Personal Rs. 20/- ; Institutional Rs 40/-

*Contact: Pradip Datta,
Publisher Safe Energy & Environment,
28, Nazrul Park, P.O.: Aswininagar,
Calcutta-700059*

Trichur Antinuclear Convention

The recent session of the Indian Science Congress has endorsed the demand that two 500 MW nuclear reactors be located in Kerala. There is vigorous campaigning canvassing for it in the political arena also. Hence we are organising an anti-nuclear convention in Trichur on 26th April to inform the public and form a strong and united resistance to the proposed project.

*Contact: K. Aravindakshan
Walden Post Eravu 680620
Dist: Trichur, Kerala*

India's Nuclear Options

27,28 & 29 April Bangalore

The National Front government's budget provide for further increases in allocation for defense

and the Department of Atomic Energy.

When tensions are fast disappearing in Europe, in our region the threat of war and momentum towards the building up of large arsenals continues despite glaring poverty and unemployment. The basic priorities are side-stepped due to a misconception of our real security needs.

From time to time there are newspaper reports about exercising the nuclear option - pointing towards the alleged secret weapons programme of Pakistan, while conveniently overlooking the fact that the Minister of State for Defense, Dr. Raja Ramanna along with the present chairman of the Department of Atomic Energy was responsible for the 1974 Indian nuclear explosion.

In August the United Nations will be reviewing the Nuclear Non- Proliferation Treaty. What ought to be India's position on it?

SAARC has become a reality. But the peoples of South Asia are being kept apart - in the interest/defense of their nations.

When most countries with nuclear power as a major part of their energy source are abandoning nuclear energy, India is planning to expand in a massive way. This expansion involves abandonment of long professed goals of self reliance and importing of reactors from Soviet Union and France.

To discuss these and other related issues, it is proposed to hold a three day seminar near Bangalore at the Ecumenical Christian Centre at Whitefield. The seminar which will be residential is being jointly organised by the following organisations:

Documentation & Dissemination Centre for Disarmament Information, Bangalore;
Ecumenical Christian Centre, Whitefield;
Friends Rural Centre, Rasulia, Hoshangabad;
Institute for Development Education, Madras

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Will Koodankulam Be Known as "Chernobyl South"?

On 24th of November 1989, Central Europe stood at the edge of a nuclear disaster comparable to the Chernobyl disaster of 1986. Recently released reports, suppressed by the East German authorities, reveal that a nuclear power plant in Greifswald suffered a near core melt-down.

In order to test the emergency switch-off system of the new fifth block of the reactor, three out of the six cooling water pumps were switched off. Instead of the expected automatic switch-off, the fourth pump broke down and the reactor went out of control. When the crew finally succeeded in switching the reactor off manually, ten fuel elements were damaged - a local meltdown. The triggers to the automatic switch-off were, according to an official investigating commission, sticky contacts of relays which were sloppily constructed, as was the rest of the Russian built reactor.

This accident is only the latest in a series of dangerous and highly dangerous incidents:

In 1974, only hastily spread jumping-sheet prevented some control rods from falling into the fully loaded centre of the reactor.

In the mid seventies all main water pumps broke down. Workers had forgotten to reinstall six small iron lids during a checkup.

In 1981, de-ionized water got into the active zone of the reactor. The speed of the fission reaction

increased and the temperature rose out of control.

In 1976, following a fire within the reactor, the complete cooling system of block 1 broke down. Only the coincidence that one of the six emergency cooling pumps was connected to the neighbouring reactor prevented a core meltdown.

The everyday conditions prevailing in the plant present an even more impressive list. The plant was kept connected to the grid under nearly all circumstances. Drunken staff, a leaking and unstable reactor building, paint covered finger-wide welding seams, missing containments, missing replacement and construction materials, chaos in cable connections, sinking foundations and radiation levels 10,000 times in excess of design specifications. In order to keep all these skeletons under cover, some 40 people from the Stasi (the dreaded secret police) were posted at Greifswald. Workers and staff were intimidated, while at the same time wages were twice as high as compared to other industries. For decontamination work soldiers were often used. Chromosome damage was discovered in six workers. Workers at the plant were conversant with its obsolete equipment that often broke down. Privately they referred to the plant as "Chernobyl North".

Editors Note: The reactors to be installed at Koodankulam are the very same VVER reactors as at Greifswald.

Reviews

Narora - The Untold Story

We have often lamented the paucity of information regarding the Indian nuclear programme. *Narora — The Untold Story* is an attempt to bridge this great chasm in information. It is published by the Network to Oust Nuclear Energy (NONE)—a group of young activists from Delhi who have made sincere efforts at educating public opinion by conducting slide shows and workshops in a number of colleges in Delhi, Aligarh, Bulandshahar and other towns surrounding Narora. This 24 page booklet contains many pictures of the people displaced by the plant and maps of the surrounding areas. The price at Rs 10 might seem somewhat excessive at first glance but as a small token of one's support for the movement it is indeed a very reasonable price.

Extract

Knowledge of the plant and of nuclear hazards

The knowledge the villagers have about the plant is partial and in many cases, distorted. Evidently, Those who bear the brunt of dislocation are not considered important enough to be briefed about the kind of work the plant does. Worse still, they have not been given any information at all about what they are to do in case of an accident.

Some who work in the plant have a clearer idea about nuclear energy. These are also the ones who mention accidents, and incidents of workers being exposed to radiation. We cannot verify these stories since the DAE does not give the public access to such information. However, we have retained reports of such incidents simply to point to the

workers' knowledge about the issues involved.

Name: Om Prakash, Village: Ramghat

They told us that electricity generated in the plant releases a poisonous gas. The gas will harm us, our grains will get spoiled, water will get affected, we will die..."

Name: Yadiram, Village: Ramghat

"Buffaloes grazing near the plant had died..."

Name: Rambharose, Village: Ramghat

"DM Sahib told us that gas will be released from the plant so we should leave our houses. What type of gas it is we don't know..."

Name: Kalawati, Village: Ramghat

"We were told that our grains will get poisoned, grass will dry up due to the poison, animals, plants all will die... But our cattle still graze near the plant. What to do? There is no other place where they can get anything to eat..."

Name: Kumkum, Age: 10 yrs.,

Colony: Bijaun Nayi Basti

"Our village has been abandoned, that is why we are here. A power house was being made there. When it started working, we would have died. My father told me this."

Name: Unknown (Woman),

Colony: Bijaun Nayi Basti

"They told us that a power house was being built. The electricity will be made from the rays of the sun god. What these rays are we don't know... We were told that if we get exposed to radiation our limbs will be deformed, or our babies will be born deformed. That is why we were settled 3 miles away from the plant..."

Name: Ramwati, Colony: Bijaun Nayi Basti

"We have not been told what we are to do in case of an accident in the plant. They said that if something happens we will be taken out of the area in buses."

Name: Jaisingh, Colony: Bijaun Nayi Basti

"...To make us leave the village they told us that there can be an explosion like Bhopal."

Name: Bankelal, Colony: Bijaun Nayi Basti

"Some men in the plant have got radiated. Pukhraj's whole body is useless. He becomes like a statue and starts shivering."

Name: Unknown, Colony: Ambedkar Basti

"In this plant, electricity will be generated through the eclipse of the sun and the gas which will be produced inside can harm us if it is released."

Name: Unknown (worker at the plant),

Colony: Ambedkar Nagar

"The boiler line taking heavy water to the turbine burst recently. We welded it... The plant was shut down for a month. When the Prime Minister came to inaugurate the plant it was not working..."

Many workers have died because of radiation. When the contractors get letters from their homes, they reply that these men have left the plant and their accounts have been cleared."

Name: Gulab Singh, Colony: Ambedkar Nagar

"I work in the plant, I do inspection work. When the plant starts, radiation can spread in the nearby areas and the villagers will suffer... because of radiation there can be a loss of blood in the body, pain in arms and legs and if a person gets a large dose of radiation he can die too... There are many labourers in the plant who do not know anything about radiation. .. one man got radiated and as soon as he stood up, he started shivering."

Name: Ranvir Singh, Colony: Ambedkar Nagar

"I have been working in the plant since the past 5 years... About a month before Rajiv Gandhi came here, there was a heavy water leakage. The heavy water was in a tank, which was opened by mistake. When we learnt about the leakage everyone ran away from there... There was no one in the control room... Finally to clear it up, labourers from outside were called in, on daily wages, they were paid around 20 to 25 rupees."

Name: Unknown (worker at plant),

Colony: Ambedkar Nagar

"When someone is exposed to radiation, then if he is normal he is put into hospital, if he is seriously affected he is put behind a glass sheet. If his family comes to see him, they look at him through the glass and come away."

Name: Unknown, Colony: Sundamagar

"We were told that the plant makes papads, and smoke comes out of these. This smoke can damage your eyes."

Name: Mir Kasim (worker at the plant),

Colony: Sundamagar

"The day after Rajiv Gandhi came to start the plant, there was a fire in part of the plant. I was working inside, welding something.. I came away. A friend who was there is in hospital now."

Strategy for Survival

"What is the relevance of a peace movement for India?" This was one of the most challenging questions during the recent regional meeting of the War Resisters of India in Vedchhi. The question was occasionally raised, but more often it was inherent in remarks concerning the priority of work on sustainable energies, organic farming, environmental protection, etc. "We have got so much to struggle within our daily sphere of work that there is little scope for a national or international peace initiative," was the consensus among some of the activists. Only slowly it became clear that exactly these daily struggles are steps towards a liberating peace.

Towards a Liberating Peace is also the title of a new book trying to provide a "coherent shared theory which illuminates hidden interlinkages in clear and understandable terms." An international team of scholars under the direction of social scientist Rajni Kothari and within the framework of the United Nations University's Programme on Peace and Global Transformation has prepared the study. It focusses on the issues of militarisation, worldwide economic crisis, conflicts over resources and human and cultural rights.

It is interesting to read the publication and to know more than the authors possibly could have known: The group's work was completed in 1989 and only the last months' developments have opened new perspectives on the dynamics of world history. Much of what is said in *Liberating Peace* anticipates the recent developments, for example the strong influence which consumerism exerts on non-Western societies, or the impossibility of maintaining economic and political independence in the neighbourhood of a superpower (see Nicaragua).

Other hopes for tendencies in favour of sustainable and peace promoting life styles have been disappointed, as for instance the defeat into near irrelevance of the ecologically and socially conscious dissidents in East Germany's polls or the rising conservatism and chauvinism in Europe and South Asia. The political and economic failure of the socialist systems, which the authors recommend as positive solutions to some aspects of the economic crisis, makes the reader doubt the assessment. But it is easy to know better now.

The book at times, reminds one of the style of the Brandt report: long enumeration of global problems and lists of recommendations for a re-orientation. Here the critical reader will not find much new information.

But the authors do more than that when they show how militarisation is one cause behind the distortion of the economy as well as of the political process. An elite which has accepted violence as a means to defend its way of life, would prefer to allot government funds to research and production relevant to the military not regarding their long term destructiveness. A large military apparatus, nuclear weapons and arms industry even in peace times breed secrecy and curtailment of civil and democratic liberties.

The authors demand a global reduction of military spending and arms production as the only way to counter the economic and ecological crisis. They point out that the North only can produce new weapon systems because the South buys its products and thus contributes to the market feasibility of the industry. However, one wishes that they also had discussed the contribution to the arms bazaar of countries like India, Argentina or South Korea.

Prof. Kothari's well-known pen is felt throughout the book: issues of peace and global transformation are analysed in relation to the role of the State. The nationalist State is denounced and hope is sought from efforts at the grassroots. If the movements give up their regional and national isolation they would be able to develop strategies for a transformation of the State. *Liberating Peace* is meant for them and hopefully would stimulate the discussion about the critical movement's role in politics and society.

Rajni Kothari, Richard Falk, Mary Kaldor, Lim Teck Ghee et al.

Towards a Liberating Peace

New Delhi: Lokvani: Tokyo :

The United Nations University 1989

LETTER BOX

There are just a few general remarks I would like to make about Anumukti. Of course the magazine is informative. The piece on the French nuclear programme was one such. But there are finer, more intangible reasons that speak for Anumukti. After all information can be gathered from other sources too.

Magazines like Anumukti are precious fragile things that need all the care that humanity is capable of mustering, to be bestowed on them. Anumukti's battle is a losing battle. I don't think that any government in the world either cares or dares to uphold environmentalism or denuclearisation against the claims of industry and capital, aided as both are by

science. This combine is ruthless and invincible I think, and it is going to see to it that it remains invincible. Power after all has never been given up for idealist or ideological considerations.

But every doomed battle represents a worthy cause. In today's world environmentalism has the only rhetoric that makes sense. All the known causes - culture, religion, nationalism, communism, feminism etc. -- are based on exclusiveness of one kind or another - geographical, territorial, sectional and so on. This kind of exclusiveness has become out of date in today's world of time-compressing locomotion.

Environmentalism has no totems. It upholds the biological foundation of life, in which every division brought about by man-made civilizations and cultures, disappears. We need this sweep of vision today, and the breadth and spaciousness it spells, to regain the wholeness taken from us by exploitative and undisciplined technological growth.

It is unlikely, as I said, that this vision and spaciousness will be given for the asking, or that they would pass into unconscious and established ways of thought and being or that they would ever be anything more than concepts. But that is precisely why Anumukti and magazines like it have to be supported. The saying of unrealizable truths is important. I would like to be amongst those who at least clap for the sayers even if they can't be sayers themselves.

Raji Narasimhan

B107 Gulmohur Park, New Delhi 110049

In the last issue of PPST Bulletin, there was a long article indicating that the Indian nuclear energy programme was costly, inefficient and made no provision for the disposal of wastes. I had sent this article to a friend of mine in the United States and he disagrees strongly with this view. (His comments are enclosed)

As you know this is a very disputed matter and it is not easy to understand, why when nuclear energy can save fossil fuel and is yet being followed all the world over, India should take a stand against its introduction and continuance. The late Sir Homi Bhabha, and our scientists like Dr Raja Ramanna and Dr Srinivasan also hold the same view. Perhaps you might like to consider all these facts and not take a completely one sided view of this disputed matter.

R.K.Patil

Civil Lines, Nagpur

I am from Kutch. Kutch is in comparison to other parts of Gujarat a very dry and thirsty area. To such an arid land the gift of water would indeed be a great blessing.

But our tiny planet Earth has suffered much from the degradations of the pleasure-seeking 'developers'. They have polluted entire creation and are still continuing to do so today. Any attempt to halt this plunder is welcome and those who raise their voice are only performing their sacred duty.

There can be honest differences of opinion on issues but amongst those who protest this terrible disbalancing of the harmony of nature there are many who are honest and pro-humanity. I myself personally know some of them.

I believe that seeing the high level of feeling raised on this issue let the dam be built and whatever

be the outcome we shall share the benefits and the harm equally.

But those farmers who shall be receiving water from the dam, why cannot the rich amongst them share half their land for those who are being displaced by the dam? It is only in this atmosphere of sacrifice that the passions of the protestors can be calmed.

The waters of the Narmada belong to the nation. It is only when their distribution is on the basis of social justice that a new and healthy atmosphere can be built up.

It is only when we (the supporters of Sardar Sarovar) can listen with respect and an open mind to the opponents, that the passions of 'WAR' can be converted and the Narmada Abhiyan can become a new beginning.

(Translated from Gujarati)

Manibhai Sanghavi,

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ANUMUKTI

A JOURNAL DEVOTED TO NON-NUCLEAR INDIA

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Aradhana Padhye, an avid *Anumukti* reader, is an old student of mine. For the past one year she has been working in a village called Mangrol, near Rajpipla in the Bharuch district of Gujarat. Recently she wrote me a letter seeking help in resolving a problem she faced in her work.

Cans of EEC donated butter-oil have made their way to Mangrol under the Integrated Child Development Scheme (ICDS). The scheme provides dietary supplement to young children. Having read stories ("Utterly Gutterly Butter" - *Anumukti* Vol.1 No. 5) regarding EEC dumping of Chernobyl contaminated food in the Third World, she was loath to give the butter-oil to children in her charge without first knowing how contaminated it was. She wanted to find out if anybody could analyse a sample from the can and tell her the radioactivity of the contents.

The letter left me at a loss. The only people I know who can do this sort of analysis are scientists of the Bhabha Atomic Research Centre. Unfortunately, nobody can believe a word of what they say since their credibility in matters atomic is close to zero. It is sad but nevertheless true that in today's India an ordinary citizen cannot place trust in the veracity of public-supported scientists especially when their own sectarian interest is at stake. And it is a further shame that nuclear overlords have so managed matters that they and they alone have the capacity to provide information. Rely on us, they say - faithfully or unfaithfully as the case might be, but rely on us you must for there is no other alternative.

But cursing this sorry state of affairs does not help Aradhana. A partial, somewhat unsatisfactory solution is at hand. Ironically a 'foreign' hand. A group in Japan has proposed the establishment of a global network of citizens' groups monitoring radioactive contamination. They became interested in the subject following reports of import into Japan of contaminated powdered milk as animal feed. Their research has revealed that highly contaminated non-fat dry milk which cannot be used in food and is therefore dead stock, is being cleverly strewn around the world. Members of the group feel that it is important to deal with the problem not only in Japan but throughout the world. They propose to make their equipment and expertise available to Third World groups lacking monitoring equipment. Anyone worried about the quality of imported milk products can send them samples for analysis.

So far so good. But is it a solution? ICDS probably covers thousands of villages and millions of children. If Japanese fears regarding the scale of dumping by EEC 'aid'-givers are justified, then we in India, the biggest recipient of this largesse are in big trouble. Instead of child development, what ICDS is achieving is integrated destruction of children's health. It is a frightening prospect. The only protection against this atrocity, would be strict and vigorous monitoring. The need for monitoring is obviously great. It needs both government and voluntary effort. Groups of young scientists need to explore ways in which their expertise and equipment can be pooled to give help. The third largest pool of scientific manpower needs to bestir itself and become useful to the people of India.

But even a large swadeshi network of scientists independently monitoring food imports is in the final analysis no "solution at all". The only real solution is to get out of this heft where millions of our children have to depend for their basic nutritional needs on the tender mercies of foreign aid donors. But doing that would mean standing on our own two feet and that is never easy for people who have become accustomed to crutches.

Goodbye Sanity

Actions speak louder than words. Some actions positively shout. The appointments of Dr. Raja Ramanna and previously of Dr. M.G.K. Menon as ministers in the Central Cabinet are examples of such actions. The Prime Minister has sent a dear signal to all regarding the competence, The openness and the future intentions of the government. One ought indeed to be thankful to him for having so quickly dispelled illusions regarding the shape of things to come.

If one person was to be chosen as a symbol of all that is rotten in Indian Science, one would not have to look farther than Dr. Raja Ramanna. His tenure as the Chairman of the Department of Atomic Energy and the controller of the lion's share of India's research funds was marked by four main features :

- * The total divorce of scientific enterprise from addressing the real needs of the people.
- * A 'darbari' style of functioning which lead to the proliferation of cliques and quickly turned bright young researchers into masters of sycophancy and intrigue.
- * An arrogant contempt for criticism where all critics could only be considered as traitors and fools.
- * Above all, monumental non-performance. The sorry state of India's atomic energy programme is a tribute to his efficiency.

By resurrecting such a person from well deserved super-annuation, the Prime Minister has sent the following messages regarding his own administration.

- * The government believes itself to be incapable of the ruling the country and needs 'experts' to do so. At the same it does not have the discrimination to choose the right experts.
- * Despite all talk of freedom of information, the right to know, the duty to inform, blah, blah the government intends to continue its secret ways hiding behind acts such as the Atomic Energy Act of 1962 and the Official Secrets Act.
- * While reassuring neighbours of its 'peaceful' intentions, the government intends to proceed full speed ahead with developing nuclear bombs, inter-continental missiles, nuclear powered submarines and all such paraphrenalia of a mini-superpower.

The more things change, the more they remain the same.

Surendra Gadekar

Independent Monitoring in France

The government monopoly of information on radiation is at last breaking up in France. One force behind this development is CRII-Rad (the Commission de Recherche d'Information Independante sur la Radio-activite), an independent monitoring organization founded in 1986 after it became clear just how unwilling French authorities were to give information on ionizing radiation following the Chernobyl disaster. (Vital information about the accident was given out three months afterwards, long after measures to reduce the amount of radionuclides entering the food chain should have been taken.)

Initially, the two main goals of CRII-Rad were to carry out research on ionizing radiation and its impact on vegetation, soil, water, etc. (this includes using a laboratory for analysis), and making the results of its research accessible. Since starting up,

the group's qualities as an alternative source of information has steadily received acknowledgement and its activities have increased.

An important project of CRII-Rad is the establishment of a monitoring network meant to create the possibility for shared, reliable information on air quality. The idea is to have monitoring facilities financed by local authorities on the municipal and regional levels. CRII-Rad has had some success in this effort. At the request of the Regional Council of the Alsace, a monitoring point and center for evaluation has already been set up and, by 1990, three more monitoring points, including one at Tam-et-Garonne, will be completed. It is further hoped that monitoring centers outside France will extend the network.

Source: *Wise News Communique* 322

High Hazards at Low Levels

Robert Roentgens discovery of the X-rays in 1895 has drastically changed the course of medical diagnosis. Radiology has made the detection of many pathological processes possible, which would have remained undetected by pure clinical examination. But in contrast to the advantages of X-rays, there has also been mounting evidence right from the early years of the 20th century of the hazardous effects of extensive use of radiology on human health.

The effects of high doses of radiation have been observed in a large number of animal studies. The fact that radiation in high doses can cause infertility, pancytopenia and death, has been common knowledge for a long time. But very little was known about the details of the mechanism of interaction of ionizing radiation with biological tissue. This lack of knowledge coupled with the enthusiasm of the pioneers for the wonders of the new technology, led to careless ways of dealing with radiation. Unfortunately this sorry state of affairs still persists.

Today there is no doubt at all about the damaging effects of radiation at whatever dose and on any type of biological tissue. Various physical, radiochemical and biological aspects of the mechanisms of the interaction of radiation with biological systems have been extensively studied in the last decades.

These mechanisms are the following:

1) Direct interaction of the ionizing particle or track with structures like the cell membrane, or with macromolecules like proteins, lipids or DNA resulting in breakage and loss of function. This type of damage is caused by radiation with high linear energy transfer like α -rays, neutrons and β -rays. This effect is random and strongly dose dependent.

2) Indirect damage caused by the induction of free radicals like OH^* and O^* which react with biological structures and macromolecules. Several microenviron-

mental factors influence the formation of these free radicals. High temperatures and high oxygen partial pressure increases the formation of these radicals whereas the presence of radical "scavengers" like cysteine or mannitol reduce their formation. The dose response curve for damage caused by radical formation flattens out at high dosage because at high concentrations the radicals begin interacting amongst themselves.

3) Non specific effects:- These result due to changes in the activity of enzymes, shifting of electrolyte balance, changes in pH levels and the general altering of the microenvironment within the cells. These changes can trigger the cancer causing oncogenes residing within the nucleus of the cell. Till now these changes could not be quantitatively correlated with radiation dosage since the detection methods were inadequate to determine minimal changes. Till very recently, such effects were not studied since the studies being conducted were survival experiments which determined the point-of-no-return damage. These indirect effects were taking place much below this level and have hence remained undetected.

Investigators in Ohio have found a variety of genetic deformities and abnormal growth patterns around the Fernald nuclear facility. Fernald, a town 18 miles northwest of Cincinnati, Ohio is host to the Feed Materials Production Centre where uranium is converted into metal form for use as fuel in military nuclear reactors. The problems include: low birth rates and slowed growth in birds; significantly fewer species of underwater organisms and genetic differences in fish and invertebrates downstream from Fernald, compared with upstream; and between 32% and 43% fewer plant species than in comparable areas away from the plant.

Now with the availability of new techniques to measure biochemical changes, it is these very non-specific effects of radiation that are considered responsible for changes in the immune system. These changes range from increased susceptibility to infection right up to cancer induction. These effects include growth retardation, mental deficiency as well as infertility. These indirect non-specific effects are caused mainly by X-rays and γ -rays and can occur even at the lowest of doses.

Besides finding out about the mechanism of radiation induced changes, experimentalists have also been concerned with quantitative measurements of dose-response relationships. The information obtained from the survival

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studies carried out in the past, has of course very limited validity in the low-dose region and is therefore of no use in estimating hazards in the low dose sphere. Nevertheless, results obtained at higher doses were simply extrapolated to the low dose range, assuming linearity in the dose-response relationships. Below a certain threshold, it was assumed that there would be no damage at all due to the repair mechanism of the living cell.

In fact, the absence of a radiation threshold has been proved many times. There is also no evidence for a threshold in the susceptibility of the repair system. At least for the DNA single strand break it was recently shown that while very small amounts of radiation can cause damage, they may not induce repair activities. So, radiation induced breakage remained unrepaired causing chromosome aberrations following mitosis.

Thus, although extrapolation of results from high to low dose regime assuming linearity and a threshold were scientifically not convincing, they were convenient for nuclear industry needs during its early phase. They provided a cloak of scientific respectability and allowed politicians to declare certain radiation doses as harmless.

The main conclusions may be summarised as follows:

- 1) There is no threshold for radiation damage in humans.
- 2) Dose response is dependent on the kind of radiation but tends to be higher than expected for smaller doses.
- 3) The mechanisms involved in the induction of cancer and mutagenesis in the low-dose regime seem to be indirect rather than direct and may

be non-specific upto an unknown amount.

- 4) The human organism is incapable of repairing the low-dose induced damage properly.

To estimate radiation damage at any stage we have to look at different factors such as increased proneness to interoccurring diseases such as anaemia and genetic syndromes like for example Fanconi's syndrome, the young age of patients and others. The highest amount of damage is probably induced in the growing fetus in utero during pregnancy. Let us examine this damage in some detail.

First of all the kind of damage expected to occur in the baby depends on the stage of the pregnancy. Generally it is believed that any chromosomal or whatever damage induced in the first 10- 21 days leads to abortion. However there are some exceptions such as the Trisomy syndromes (e.g. Down's,) though only a very small percentage of them reach term. Actually there are chromosomal aberrations found in some 70% of aborted fetuses. Severe malformations like anencephalis, Cyclopes etc. are induced by damage up to 10 weeks of gestation.

After the stage of organ formation, induced malformations get rare. One would rather expect unspecific damage, leading eventually to enzyme defects and disorders of the immune system.

Induction of leukemia is also believed to take place in the third trimester. Radiation influences the development of the brain of the fetus/embryo in every stage of pregnancy up to term. The mechanism of this process is the disturbance of mature neuronal cells' migration from the central regions towards the peripheral cortex. While the neuralglia-cells' matrix is nearly organised by some 20 weeks, migration of the neurones goes on until delivery or even later.

According to a study published in Japan in January 1989, workers in nuclear power plants have double the normal level of chromosome abnormalities. The study was conducted by Dr. J. Muramoto of the Environmental Medicine Research Institute.

The 115 workers examined were all men, ages 20 to 61, whose length of employment ranged from four months to 12 years. Cumulative exposure levels as measured by film badges were as follows: less than 1 rem (10%); 1 to 5 rems (44%); 5 to 10 rems (33%); more than 10 rems (13%), the highest exposure was 14.3 rems.

A total of 93,505 lymphocyte cells from the blood of these workers were analyzed for chromosome abnormalities. It was found that the incidence of chromosomes with two chromatids and ring - shaped chromosomes was 0.22% compared to 0.12% among local residents. Another finding was that the number of abnormally shaped chromosomes was proportionate to the level of radiation exposure.

Source: *Nuke Info Tokyo*, Mar/Apr 1989

Glossary of Medical Terms

Anencephalis:- A child born without development of brain.

Chromomers :- One of the serially aligned chromatin granules forming the chromosomes

Chromosomes:- Thread like structures in the cell nuclei, which carry genetic information and are responsible for hereditary characteristics

Cyclopes:- severely malformed child born with one eye, like the giant in Greek mythology.

Cystein :- Amino acid; guards liver from toxic material

Down syndrome:- A type of mental retardation caused by a chromosomal abnormality, giving rise to certain characteristic physical features, notably an oblique slant of the eyes.

Fanconi's Syndrome :- Complex multiple defects in kidney function caused by genetic disorders in the kidney structure

Leukemia :- cancer of the white blood corpuscles in the blood.

Leukopenia:- Marked reduction in the number of White Blood Cells.

Lipids :- Commonly known as fats and oils

Macromolecules :- Large molecules like fats, proteins etc.

Manitol:- An organic alcohol which guards liver from toxic material.

Mitosis :- A type of cell division in which the number of chromosomes remain the same in daughter cells.

Mutagenesis :- Any heritable alteration of the genes or chromosomes of an organism.

Neuralgia-cells :- Primitive nerve cells

Oncogenes :- cancer producing genes.

Opportunistic infection:- Infection caused by a pathogen that can cause disease only in a host with lowered resistance

Pan-cytopenia :- Reduction in the number of blood cells of all types.

Trisomy :- A genetic disorder where one chromosome is represented three times in an otherwise diploid set.

Epidemiologically investigators have found significantly lower school performance from children who were irradiated in utero during atomic bomb testing in

Nevada, the Three Mile Island Nuclear accident and at Hiroshima.

Radiation Induced childhood leukemia has been observed in the vicinity of several nuclear plants. First and probably the worst of all is Sellafield (formerly Windscale) in West Cumbria, U.K. Rates there have been ten times higher than the British averages. Other spots are Dounreay in Scotland and Aldermaston and Burghfield. Elevated childhood leukemia rates have also been reported from Yugoslavia and Idaho Fall in U.S.A. as well. Even in Germany, despite claims of running the world's safest reactors, recently published epidemiological surveys provide evidence of increased childhood leukemia around nuclear installations.

Tragically and somewhat ironically, the nuclear disaster at Chernobyl in April 1986 has provided scientists with an opportunity to study in depth the effects of low dose radiation. The average population dose in Germany was within the range of 150 - 250 mrem during the first year. However, already some acute effects have been observed. The incidence of Down's Syndrome was raised 5 fold above the average in West Berlin in January 1987 correlated to the mothers' estimated date of conception having been during the days of the main fallout in May 1986. To add further proof to the findings, a survey on the incidence of Down's Syndrome was conducted all over Germany. It duplicated the fallout-dose-pattern showing for example the highest increase in Bavaria which received the largest fallout.

In U.S.A. Prof. Sternglass has reported an increase in infant mortality and death from causes such as opportunistic infections and AIDS during May 1986. Discussing the epidemiological data he pointed out that the common cause of death among these groups could have been an acute drop in leukocytes which led to the deterioration of pre-existing diseases. Actually a short-time temporary leukopenia after low-dose irradiation has been reported several times already even in healthy people. This has frightening implications for Europe if one considers that the Chernobyl fallout in the U.S.A. was just 1% of the European average amount.

Anyway, Robert Rontgen's and Marie Curie's days of relatively careless handling of radiation are gone. Both died of leukemia. Health professionals need to be especially concerned. They account for some 80% of the man-made radiation exposures.

Wolfgang Hoffmann
Bonn, Germany

The Real Scar is Within

I am Millie Smith. I was born and raised in Pasco, Washington, several miles downstream from the Hanford Plant, residing there from 1947 to 1967. I am one of the 20,000 children that the Center for Disease Control believes have been exposed to the secret radioactive releases of Hanford, which have been reported to be among the world's largest. Not only did our government fail to warn us and take safety precautions, but the releases were kept secret for 40 years.

If the releases hadn't been made public when they were in 1986 through the Freedom of Information Act, I likely wouldn't be alive today. After years of weakness and poor health, going from doctor to doctor getting no answers, I was finally checked for and discovered to have metastasized thyroid cancer only after the knowledge of the releases. That discovery was on December 23, 1986; and the following day, Christmas Eve, I was told that I had less hope. The five hour delicate surgery on January 23rd, 1987 revealed extensive cancer throughout my neck, jugular vein, laryngeal nerve, trachea, along my oesophagus, in between my lungs and throughout my upper right chest. Two of my parathyroids were removed; they regulate calcium and their deficiency can be life threatening, affecting the heart and causing permanent brain damage. I experienced a deficiency temporarily after surgery but that was brought back under control.

My doctor said that I could have had this cancer for 20 years as it is usually slow growing. If thyroid cancer is detected at an early stage it is usually easy to treat - but since mine was extensive, my doctor said that it will be difficult to cure; and I have a high risk of reoccurrences and more surgeries. Following surgery, I was bedridden for almost a year and have relied on chore services for the last two years, I experienced severe short term memory loss and lack of concentration. One of my vocal cords was temporarily paralyzed.

In November 1987, a reoccurrence of a malignant tumour was discovered in my neck and I was treated with radioactive iodine- 131. I took a smaller dose to avoid isolation in the hospital. I was told that my urine would be radioactive for three days, that I shouldn't kiss anyone and stay away from babies. I was also told that those treatments would increase

my risk of leukemia. Following treatment I experienced nausea and for the next few months chunks of my hair fell out and I had skin eruptions

Right now I am better than I was a year ago but still I am waiting to see whether my condition will progress or worsen. I am still very weak and have fluctuating memory trouble and slowness of thought. I have to take thyroid medication for the rest of my life as I'm unable to live without it. I still have no prognosis. I can't but help wonder if I have any more undetected illnesses.

Since my surgery, I have been trying to find as much information as possible about radiation effects and what happened to us. The more I've learned, the stronger my belief has been that my health problems are due to Hanford releases. Last summer I was told by Japanese radiation specialists that my health history since early childhood is almost identical to their radiation victims.

My history includes great susceptibility to infection and illness, lethargy and weakness, low physical capacity, frequent dizziness, nausea and vomiting, frequent heavy nose bleeds and pains in my arms and legs. I remember especially experiencing nausea and a bad taste after drinking milk. At the age of 9, I was tested to be at high school level academically, yet by the time I was in high school, my mental process slowed down. In 1964 hypothyroidism was discovered and I was placed on thyroid medicine temporarily. Birth defects in my reproductive organs were also discovered, requiring minor surgery and hormonal treatments.

In 1980, mild spinal defects were discovered a mild spina bifida and deformity of vertebrae in my neck. I have had menstrual abnormalities and have suffered three miscarriages.

I have been unable to work. Before my cancer discovery, I felt I was 80 years old. My life has been a struggle of hardships and setbacks that many other Hanford downwinders face. I have a permanent scar that you see around my neck - yet my real scar is invisible. Due to my health problems I have lived in poverty most of my life. There have been times when all I had to eat was rice and popcorn for months. There were many winters of having to go without heat; there were times I was homeless

for although I had money for rent, no one would rent to me as I didn't have a job. Presently I don't have enough money for bills and the needs of my daughter.

We had to go to food banks and the Salvation Army. I don't have money needed for nutrition. Yet, I am just one of the many whose lives have been damaged. My mother told me that almost everyone she knew around Hanford area had at least one person in their family with thyroid cancer. My family doctor has stated that he treats too many thyroid disorders in the area. My mother and many of my old neighbours have severe lung problems. My sister has had skin cancer and birth defects. Two aunts and five cousins have had cancer. I have heard people in the area remark how somebody is either having leukemia, brain tumours or cancer. I remember two close friends and two other classmates who died of cancer while still in high school. After doing a health survey of my former classmates, I learnt of more cancer deaths and multiple health problems. On family land next to Hanford, 24 of the 28 families have been afflicted with cancer, thyroid problems and serious birth defects such as no eyes, no skull, no hips. More and more stories keep emerging. I just recently learnt of a woman who lost ten babies.

There is no doubt in my mind that we have been affected by the Hanfor holocaust. The government denies any effect of the releases and demands proof. We feel that they should prove our illnesses aren't due to radiation. Scientists have estimated that residents near Hanford received ten times more radiation than people at Chernobyl. How can anyone deny that we have been affected?

I believe that we have also been affected in other subtle ways, possibly causing damage to our immune systems. It has been stated that no two persons will experience the same injury from radiation and neither will any molecule or cell. So how can we really know the extent of our damage?

It doesn't take an expert to see that our land and people have been contaminated. The government's failure has been alarming all over the country. Our country, I fear is on a path of suicidal destruction, killing its own people in the name of "defense" and "national security." Yet we have no security, our bodies have no defense. We are as abused children, victims of our own country. We can have all the weapons in the world - yet we cannot be a strong country unless we are strong within.

I came here to tell my story in hopes that with

more public knowledge, action will be taken to prevent further contamination and that we will be helped. Not only does the government refuse to acknowledge us and take responsibility for their actions or compensate us - they just keep ignoring us. The claims that we have filed have been denied, and we are not allowed to sue. Many still do not know of the releases.

We from the Hanford area want recognition as the Hanford hibakusha - atomic bomb survivors as are the Japanese. We also want an apology from our government. We want and need a radiation research and medical center and hospital where we can get immediate free health care by radiation specialists as they have in Japan. We also need a toll-free number where downwinders can get accurate information. We want to know the full truth of what happened to us. We want the government to be accountable for its actions. We want justice.

Two years ago, I was fighting for my life; today I am fighting for the life of all of us and for the life of our land. I would like to quote from a great Indian leader who speaks for the heart of the Indian nation on his message to our government over 100 years ago. Unfortunately, his wisdom went unheeded. They too were betrayed by our government and became victims in their own country.

"If we sell you our land you must remember it is sacred. We are part of the earth and it is part of us. If we sell you our land you must remember that the air is precious - that the air shares its spirit with all the life it supports. The wind must also give our children the spirit of life. If we sell you our land you must keep it sacred."

The earth is our mother; whatever befalls the earth befalls the sons of the earth. The earth does not belong to man - man belongs to earth. All are connected. Man did not weave the web of life - he is merely a strand; whatever he does to the web he does to himself. Continue to contaminate your bed and you will one night suffocate in your own waste. If we sell you our land - love it as we have loved it - care for it as we have - preserve it for your children."

I ask you - what legacy do we have for our children? We downwinders have been exposed to the wind of death. I hope our future generations would have life.

From testimony given before the U.S. Congress
Source : *The Hanford Journal*, number 8 spring 1989

In the Face of Uncertainty

A report on radiation safety standards

Radiation's history teaches us many lessons. Certainly one of the most important ones centres on the humankind's passion for leaping without looking. We have been plunging forward in the name of technological advancement without a great deal of concern for the consequences of 'progress'.

The Promise of Things to Come

It has been said many times and in many ways that those who do not learn the lessons of history are destined to repeat its mistakes. History assists us to understand where we have come from and can shed light on our future directions. In the field of radiation an eagerness to exploit new discoveries has created a myriad of problems. The situation is of course not unique to radiation. Other examples of the same tendency are the use of the tranquilizer thalidomide, the fibrous mineral, asbestos and the refrigerants CFC's.

The advent of X-rays in 1895 was soon followed by the knowledge that radiation can cause injury. By June 1896, X-ray injuries had already been recorded. By 1903 attention was also drawn to the dangers of scattered radiation in radiographic rooms. Despite these early warnings, X-rays continued to be used with wild abandon. Not only were X-rays used as a diagnostic aid, but also as a therapeutic measure for a veritable host of disorders ranging from inflamed tonsils to whooping cough as well as all kinds of cancers.

Unfortunately, in at least some instances, the 'treatments' produced effects more severe than the original complaint. One case in point involved the use of X-rays by a U.S. doctor to remove unwanted hair from his secretary's armpits. His 'treatment' led to burns and eventually to amputation of both the woman's arms.

Whilst many of the gross excesses linked with the use of X-rays occurred in the early part of this century, recent reports indicate that deleterious health effects are still occurring through over-exposure of patients and technicians. A 1983 WHO report states that "throughout the world there is overuse of diagnostic radiology..."

Medical profession also adopted radium as a therapeutic agent in the belief that it possessed healing properties. Until the 1930s thousands of people in the U.S. actually ate and drank preparations containing radium under the illusion that "radium has absolutely no toxic effects, it being accepted as harmoniously by the human system as sunlight is by the plant." The injection with radium of children suffering tuberculosis was only stopped in 1951 when it became obvious that it was completely ineffective. Yet by this time the carcinogenic properties of radium had long been known.

With the advent of the atomic bomb and the subsequent use of atomic energy for electricity generation, the number of radiation deaths multiplied. Rosalie Bertell, in her book *"No Immediate Danger"* estimates that the "global victims of radiation pollution conservatively number 13 million to the year 2000."

Unfortunately, it is impossible to establish with certainty, cause and effect regarding the onset of cancer in any one individual. This is because a person may be exposed to several carcinogenic hazards during her/his lifetime, any one of which could induce cancer. Though what is well established is the fact that the greater the collective dose of radiation the larger the number of resulting cancers in the exposed population. The situation is similar to playing Russian roulette. A single bullet loaded in a revolver barrel will eventually lead to someone being shot - we are simply unable to say who it will be.

In the Face of Uncertainty

One of George Orwell's most significant contributions as a writer was to foresee and demonstrate how the English language could be used in ways which belied common understandings.

It would be convenient and reassuring to understand safety standards as levels of exposure to radiation which cause no harm, danger or risk to human beings. This is however not the case. Perhaps, early in this century, those given the responsibility of establishing radiation standards thought them safe. This is certainly no longer true. The term has persisted but the meaning has changed.

Safety standards are now defined as determining 'acceptable' risk for workers and the general public. Whilst it is possible to quantify risk, it is much more difficult to reach conclusions regarding acceptability of any particular level of risk. Against what benefits do we assess risk? And more importantly, who is to make the value judgement? Those bearing the risk? Those reaping the benefit? An Independent' body ?

Radiation protection standards were first formally issued by the German Roentgen Society in 1913. However, it was only in 1934 that the International X-ray and Radium Protection Commis-

sion first adopted the concept of a tolerance dose - believed to be a dose below which no harmful effects would occur. The tolerance dose was fixed to be "about 0.2 roentgens per day. However, at the very time, this limit was adopted by the international committee, the U.S. committee had agreed upon half this dose as the tolerance dose. Many U.S. geneticists then believed that even this lower limit was too high if genetic effects were taken into account. Characteristically, their response was to agree to a change in terminology. Tolerance dose became permissible dose. Although it is doubtful if the change was successful in conveying to the radiation worker that a permissible dose was not to be considered entirely harmless.

The move away from a tolerance dose was the first major shift involving the principles of radiation protection. The shift was accelerated after the formation of the International Council for Radiological Protection (ICRP) in 1950. In 1954, ICRP acknowledged that "since no radiation level higher than the background can be regarded as absolutely 'safe', the problem is to choose a practical level that, in the light of present knowledge involves negligible risk."

A further revision was adopted in 1958 and published as *ICRP Publication 1*. In this document a reduced maximum permissible dose of 5 rems/year was recommended for workers (0.5 rem for he

general public). This standard has remained unchanged ever since.

The Swedish National Institute for Radiological Protection (SSI) has promulgated new radiation standards that will take effect in 1990. The new standards are the result of a new law which came into effect July 1st, 1988. Earlier Sweden was following the standards recommended by ICRP. The maximum allowed lifetime exposure to a radiation worker will be 700 millisieverts (mSv), which in practice means an annual dose of 15 mSv/year, based on a 45-year working life between 20 and 65 years of age. The present standard is 50 mSv/year with no lifetime dose limit. SSI has also made a rule that at 30 years of age the cumulative exposure must not exceed 180 mSv. The maximum allowed exposure to a pregnant woman will be 5 mSv during the pregnancy period. Further, she now has the right to request temporary transfer to a radiation free environment.

Interestingly, the ICRP assumed responsibility for defining what exposures were to be considered acceptable stating "the permissible dose for an individual is that dose, accumulated over a long period of time or resulting from a single exposure, which in the light of present knowledge, carries a negligible probability of severe somatic or genetic injuries; furthermore, it is such a dose that any effects that ensue more frequently are limited to those of a minor nature that would not be considered unacceptable by the exposed individual and by competent medical authorities."

Having accepted that all exposure to radiation imposes risk on those exposed, the ICRP recommended in 1966 that "any unnecessary exposure be avoided." It also adopted the ALARA principle stating "that all doses be kept as low as readily achievable, economic and social considerations being taken into account. The significance of this move was considerable. The difficulty of defining what was 'readily achievable, economic and social considerations being

taken into account' created additional problems.

Whilst authorities concerned with radiation safety have been prepared to follow ICRP's recommendations, it is important not to accept ICRP's pronouncements without question.

The main reason for scepticism is the fact that the data on which ICRP's recommendations are based concern the victims of atomic bombardment of Hiroshima and Nagasaki and this data has been under wholesale review. (See Anumukti Vol.1 No.3 - "Radiating Complacency" and also the box on this page)

Recent reevaluation of the Hiroshima-Nagasaki data indicates that the risk estimates of the ICRP for radiation toxicity are far too low and are indeed grossly misleading.

When Safe's Not Safe Enough

The philosophical foundation underlying nuclear enterprise are the tenets of Utilitarianism propounded by Jeremy Bentham and John Stuart Mill. They posit

"as the moral goal of all human actions, the greatest possible balance of good over bad for mankind as a whole." Somebody has to pay the price for 'progress' but the society as a whole has a net benefit. Let us take a quick look at who has to pay the price and for whose benefit.

Usually, those who bear the most risk are precisely those who receive the least benefit. They include :

The workers - It may perhaps be argued that the workers by their willingness to engage in certain occupations willingly accept the associated risks. This is questionable since the hazards faced by the workers are down-played. The danger of uranium mining had been known for a hundred years before mining in a concerted fashion began in 1945. Yet it took the United States Congress until 1967, with many resultant miner deaths from lung cancer, to legislate for mine ventilation. Workers are reminded that exposures are within 'permissible limits' recommended by international safety authorities which mitigates against any real notion of danger and therefore knowing consent to that danger.

The poor - who cannot exercise the choice of moving far away when nuclear facilities are built without so much as a by-your-leave in their vicinity.

Pregnant women and developing infants - who are particularly vulnerable to radiation. It is estimated that a child is three to six times more likely than an adult when both have received the same dose of radiation.

Indigenous people - whose lands are a special attraction to nucleocrats all over the world. Most nuclear activities, from uranium mining to weapon's testing and eventual waste disposal are carried out in places which are home to indigenous people. Whether in Australia, United States, the Pacific or in India, the same story holds.

Future generations - because radioactive material remains toxic for thousands of years, they will bear the costs without receiving any benefit whatsoever.

The important point to make is that radiation risks are not distributed evenly throughout the population. Neither are the benefits. By adopting a utilitarian perspective there is no need to examine the distribution of the loss and the gain.

The major beneficiaries of nuclear industry are owners of corporations producing and supplying the goods and services involved. (In India the names that stand out are Tata, Larsen & Toubro and the Walchand group.)

Benefits in the form of status and power in addition to remuneration are bestowed upon many scientists and technocrats. The bulk of the population does derive benefit from goods and services produced. But there is an important distinction between the risks borne and the benefits received by this group. The risks are involuntary, whereas the benefits need consent in the sense that they are obtained via monetary payment.

Averaging Syndrome

"By the time we calculate the total loss of radionuclides in an average nuclear plant, average this loss over time to determine the approximate yearly effluence in curies, and then determine average air pollution and deposition on living plants and groundwater, average uptake of radioactive chemicals by plant and animal, average diet and recreational habits of the average person living in the vicinity of the plant, we have a (fictional) estimate of human radiation exposure over the normal plant lifetime. Sometimes the dose is averaged over the whole population of the country rather than the population downwind or downstream from the plant, making the average doses seem smaller. Of course some people receive much higher than the average dose."

Rosalie Bertell

No Immediate Danger.

The epistemology which underpins the principles of standard setting is positivist. The three main characteristics of this approach are: the rejection of subjective knowledge; a reliance on causal explanations; and the veneration of technical expertise. The logical consequence of this kind of thinking is the exclusion or rather non-recognition of value judgments. Atomic energy morality just assumes that nuclear technology raises only technological but not ethical questions.

The reliance on causal explanations allows nucleocrats to implicate carcinogens other than radiation when increased cancer incidence is reported near nuclear facilities. While the nucleocrats demand "absolutely certain proof" of radiation harm they assiduously discourage research which may lead to results contrary to their position.

There are numerous instances where the power over purse strings has been used to scrap prematurely unpalatable research. Particularly important areas of study have just been neglected and then claims regarding deleterious effects have been dismissed.

due to "insufficient evidence." The strangely curious lack of curiosity regarding the effects of high natural background radiation in monazite sands of Kerala on part of atomic energy authorities in India is an instance of such blind spots.

To lack of data resulting from insufficient research one must add the occasions where information has been deliberately suppressed. Most nuclear establishments have been unwilling to disclose health statistics of workers and people living in the neighbourhood of nuclear sites. The French have kept Polynesian health statistics secret as have the Russians details of the Kyshtym disaster.

Given the above, it is impossible to have confidence in safety standards regardless of the composition of standard setting authorities. Yet, it is interesting to find out who are the judges who decide the question of acceptability of risk.

Patrick Green has conducted a comprehensive analysis of ICRP's membership and has concluded that far from being an independent organisation with members elected on the basis of scientific merit, "the ICRP is a dosed organisation whose membership is open only to a small select group of individuals". The majority of these members have been affiliated to an organisation concerned with the commercial exploitation of nuclear energy.

"The concept that all decisions of the government should be the subject of a public debate. ..is a dangerous heresy... The experts must, in the end, be trusted."

Sir Philip Baxter (Australian nucleocrat)

The fact that a small elite formulates safety standards should cause no surprise. After all, if issues are defined in a technical manner, they require 'technical experts' for their resolution. Under the guise of independence and objectivity, divorced from public opinion, technocrats can comfortably sit in judgement.

The Escape Route

It is only when the 'have not' citizens, are deliberately involved in the decision making process that many of the inequities associated with standard setting, will be overcome. The cardinal principle ought to be that "no individual or community will be forced against his/her/their will to absorb noxious by-products of the activity of others".

If we accept this principle as a moral imperative we have two possible pathways to reach our egalitarian objective. Firstly our aim can be obtained by eliminating human radiation exposure. Secondly the consent of those most likely to be affected could be obtained. Let us consider each in turn.

Standard setting authorities themselves acknowledge that all ionising radiation exposures, no matter how small, carry some risk of cancer induction or genetic damage. Considering the potential for widespread contamination following accidents, the extremely long lifetimes of radiological toxins once formed and the routine releases by nuclear facilities into the environment, it is impossible to eliminate radiation exposure, whilst the nuclear industry remains in operation. To outlaw involuntary exposures we must eliminate the source - nuclear industry in its various facets. Alternately, we can convert involuntary exposure to voluntary exposure through the consent of those affected. Here the most powerful argument is the fact that by far the largest group amongst those affected cannot give their consent since they are yet to be born.

If we are interested in achieving a high degree of radiation protection it is logical that standard setting authorities must also include representatives of the unions and community groups, and that they be provided with necessary information and financial resources to ensure that their participation is effective rather than token. Obviously a standard setting body consisting of those likely to be affected by radiation will develop alternate protection principles to those developed by organisations using equipment that is the source of radiation. The 'burden of proof needs to be reversed so that those responsible for creating the hazard must show them safe rather than those exposed must show injury.

Finally, if radiation standards are public policy and not public pacifiers, then at a minimum the policy ought to include daily emission monitoring by an independent person. Standards suggest what ought to occur, monitoring will detect what actually occurs. If monitoring detects exposures above established protection levels, people must be compensated for any deleterious effects.

The question of compensation does raise the thorny problem of cause, and effect. One possible mechanism to circumvent this problem would be to award compensation on the basis of risk involved. If a certain level of radiation exposure in a given population will result in a certain percent of that population developing cancer, then everyone within

that population who actually does develop a cancer should receive a minimum compensation at that percentage rate. This procedure would represent a significant improvement on the present situation where to all intents and purposes, no-one receives

compensation for injuries suffered.

Glenn Foard
Community Education Publication Association inc.
Australia

Glossary of Technical Terms

activity - The number of disintegrations of a given radioactive nuclide over a given period of time. The modern (SI) unit of activity is becquerel (Bq) defined as one disintegration per second.

curie (Ci) - The old unit of activity. One curie equals 37 billion (3.7×10^{10}) disintegrations per second. Originally adopted in 1910 as the radioactivity of one gramme of radium.

free radicals - Entities formed after the breaking of chemical bonds holding molecules together. They are chemically extremely reactive.

Ionising radiation - Radiation which can deliver energy in an amount capable of knocking electrons off atoms turning them into ions.

rad (radiation absorbed dose) - The old unit of dose of ionising radiation replaced in the SI with gray (Gy). One rad is equal to 100 ergs of energy absorbed per gramme of body dose. Roughly the X-ray dose needed to kill a mouse.

rem (roentgen equivalent man) - Different ionising radiations produce different amounts of damage to biological tissue. Rem is a unit which takes into account these differences by multiplying the absorbed dose with a quality factor which differs for different kinds of radiations. This old unit has now been replaced by sievert(Sv). One Sv = 100 rem.

mSv (milli-sievert) - Thousandth of a sievert.

ANUMUKTI STILL NEEDS YOUR SUPPORT

Cobalt Blues

Cochin is to have the dubious distinction of pushing India into the era of commercial food irradiation (see box). We have previously carried reports about the harmful effects of this food preservation technique. Here we present a list of accidents that have taken place in irradiation plants around the world.

India's first commercial food irradiation complex is to be commissioned in Cochin shortly. Initially the unit will irradiate spices and later will be extended to lish, prawns, onions and potatoes mainly for export. The complex is being jointly set up by Bhabha Atomic Research Centre and the Spices Board. Cobalt-60 is the irradiating isotope to be used in the unit.

The Central Government has reportedly accepted the Codex General, a safeguard set up by several international organisations under the U.N. to oversee the quality of the irradiated food.

Irradiation is a hazardous process. Exposure to the unshielded sources can be fatal. Routine exposures to even low levels may cause long-term harm. The radioactive materials have to be transported into the plant and the spent sources (still radioactive) removed and any contaminated material disposed of.

Accidents may happen at any stage, causing exposure of workers, the public and the environment. Often, lack of local expertise means that maintainance teams have to be flown in from overseas to deal with emergencies.

The following accidents all happened in plants built and operated under the internationally agreed system of regulation and control. Trade union members in the food industry have reason to be concerned about the health and safety of their members.

- * Radiation Technology Inc (RTI), New Jersey, USA.

In 1986, the US Nuclear Regulatory Commission (NRC) revoked the RTI license for repeated wilful violations of worker and environmental safety. Incidents included by-passing safety interlock systems resulting in exposure of a worker to the unshielded source (1977) and illegally burying contaminated material from a leaking cobalt 60 source (1975).

Martin Welt, the company president, ordered employees to flee to NRC investigators. The NRC action resulted in his resignation. The US Department of Energy (DOE) promptly hired him to advise on its food irradiation programme. Welt was eventually convicted of conspiracy in the US courts in 1988. His new company Alpha Omega Technology, has approached the World Bank for funds to build irradiation facilities in South East Asia.

- * Isomedix, New Jersey, USA.

A leaking source contaminated the pond water which was then disposed of down the toilets, contaminating the sewerage system, and exposing workers to radiation. Workers reported the cover-up. Radioactive contamination was still detectable five years later.

The NRC has cited the company for allegedly overexposing workers, failing to signpost radiation areas, allowing food and cigarettes in radiation areas, operating without authorised personnel and failing to monitor water disposed to the sewer.

International Nutronics, New Jersey, USA.

The company was fined in 1986 after cover-up of a radioactive spill in 1982. Management ordered employees to dispose of the radioactive water down shower stalls, and move their radiation badges from belt to collar to record a lower dose. The contamination was still detectable outside the building ten months later.

- * Hawaii Demonstration Irradiator, USA.

A radioactive leak at an irradiator in Hawaii in 1967 contaminated the pond water, shipping cask, roof, machine room, tools and worker's clothing. The clean-up cost the state \$385,000 in 1979. Dangerously high levels of contamination were still detectable outside the building in 1980.

- * Radiation Sterilizers Inc, Georgia USA.

A leaking caesium source in June 1988 contaminated the pond water, workers' clothing, cars and home carpets, as well as some of the irradiated

products including medical supplies and milk cartons. The clean-up was still going on in 1989 and had already cost several million dollars. The investigating team recommended that new regulations on radiation safety and emergency plans are needed for all US irradiators.

- * University of Tennessee, USA.

A worker bypassed the safety system of an irradiation facility at the University of Tennessee in 1971. He survived the high dose of radiation.

- * Benton Dickinson, North Canaan, Connecticut, USA.

Aluminium boxes containing products being irradiated, jammed into the source rack in 1981, preventing it from being lowered. Despite this, the control panel indicated that the cobalt source was safely inside its storage pool. It was only the radiation monitors indicating high radiation levels that warned of the problem. Technicians had to be called in from Canada. While lowering the rack they dislodged several cobalt rods which had to be recovered using long handled tools and mirrors.

- * Stimos, Pontecico, Italy

A maintenance worker entered the irradiation cell of a corn irradiation facility on the conveyor belt while the source was operational. He received a high radiation dose and died 12 days later.

- * Institute for Energy Technology Irradiation Plant, Kjeller, Norway.

Failure of safety devices allowed a maintenance technician to enter the irradiation cell with the source exposed. He died 13 days later.

Delmed plant, San Salvador, El Salvador.

Three workers at the Delmed plant received serious radiation injuries after irradiation equipment malfunctioned in February 1989. Delmed had to call Nordion, the suppliers of the plant, to send a maintenance team from Canada to remove the cobalt from the defective source rack.

- * Steritech, Dandenong, Australia.

This plant has to be shut down for five days because a wire cable controlling the Cobalt 60 source rods had jammed, preventing the rods from being lowered into the pool. A maintenance team had to be flown in from Canada to remedy the problem. Technicians and equipment to deal with such emergencies are not available in Australia.

Unthinking the Unthinkable

'Nuclear weapons are machines, and machines, it has been said, are finally ideas.' On the basis of this thought-provoking statement Jeff Smith in *Unthinking the Unthinkable* criticizes the nuclear policies of establishment and its opponents alike.

Unthinking the Unthinkable is not an easy book! This is not so much because of its language for the essay is clear and well-structured. But the author asks the reader to question some of those views which have become so common that they seem to be rather natural: Has human history really entered a fundamentally new age with the invention of the nuclear bomb? What does it mean when the bomb's destructiveness is compared with the omnipotence of God? Does progress in knowledge and sciences create new realities which we cannot escape? How can anybody even think of destroying whole populations in a nuclear war?

Of course, it is not possible to unthink nuclear weapons, to make them disappear by mere thinking. The fact that once invented, harmful technologies remain with us in a mephistoan way has disquieted the more thoughtful spirits in the last centuries. Jeff Smith, however, thinks that 'people have never availed themselves of every technically feasible means of violence.' Here he sees a chance: if we understand the causes of nuclear weapons, we perhaps can attempt to reorient the political thinking which necessitates nuclear arsenals.

In his effort to problematize the common-sense assumptions underlying the nuclear debate on both sides, the author uses a highly relevant, but hitherto neglected method. While admitting their respective value, Smith is discontent with economic and psychological approaches as well as with histories describing the nuclear culture of planners, scientists and strategists. He refers to literary and textual analyses and in his search for the root causes of the nuclear problem he moves back as far as to the early Middle Ages. Much of Western thinking in the background to the issue under discussion had been shaped in the times of St. Augustine.

Smith, who anticipates Marxist criticism of his basic assumptions, does not deny the existence of economic interest as a cause for the creation of nuclear arsenals. But he sees weapons, nation states

and technologies as results of beliefs generated by discourses and ideologies in historical time. This leaves hope, for 'modern politics is simply discourse, and discourse can always be deciphered. States and their war policies are not mysterious, fixed edifices... They are products of cultural history, and once we see this, the problem of reinventing them appears in a whole new light.'

However, there are some obstacles in the way of realizing this hope. Often the construction and deployment of the nuclear bomb in the first half of the 40ies is regarded the beginning of a fundamentally new age in the history of mankind. Refuting this common theory, Smith quotes Lewis Mumford who regards the invention of the dock as the key Western invention. Other authors have argued that inventions like an improved plough in the seventh century have changed the relation of the West to nature. Looking back in time merely a few decades, perhaps obscures the continuity in cultures and gives a disproportionate emphasis to recent developments. In such a situation we become helpless by inactively looking back at the supposedly *golden days* before the bomb. This is no way out.

In his analysis, Smith uses a wide range of sources from philosophical texts to films like *War Games* and *Dr. Strangelove*, from Shakespeare's *Henry V* to Ronald Reagan's speeches. Shakespeare proves especially useful to demonstrate the development of the nation-state concept at the beginning of modernity. This concept of a nation-state which monopolizes the means of violence up to extremes like total civilian destruction is necessary for the deployment of nuclear weapons. 'States are simply made singular subjects - metaphorically treated as if they "did" things, acted as wholes', a phenomenon which Smith calls *modern animism*. It leads to a neglect of the individual human being who wants and does things and finally, it lets total destruction appear moral, if it only achieves its ends.

Similarly the author problematizes the supposedly valuelessness of technology, another means to achieve ends. 'Perhaps besides being machines themselves, nuclear weapons are also independent products of the whole modern program that machines represent, along with wars and states: a program that places new value on getting the job done, no

matter how diabolical that job might have seemed to an earlier way of thinking.'

Here, Smith's essay becomes relevant to the ecological movement as well: it reminds of other 'jobs' like energy production and development by large scale deforestation or construction of socially and ecologically destructive super-dams.

Whereas the discussion of the origins of the nation state is nothing new for the political historian, the analysis of Reagan's speeches on SOI shows how much Western history has influenced the concept of deterrence. Both, India and Pakistan are playing with the nuclear option. They are dealing publicly with a concept which was developed by the master players of nuclear deterrence and is a product of an alien cultural history. This concept which, moreover, is now being understood as a problem in its place of origin, has been isolated from context and is being thoughtlessly applied to different circumstances.

Jeff Smith, while challenging the Western reader to re-assess the ideas which created nuclear weapons in the first place, is relevant to South Asia as well. His book is of value to all those who want to critically understand the roots of policy concepts which are offered by the West to other parts of the world as logical and sane ways of solving problems.

Smith's suggestions remind one of discussions in the Gandhian movement. While stressing the importance of values of co-operation and community, he feels that creating new belief systems would be historically easier to achieve than a new growth of community. This task is definitely more difficult for the urban Western activist than it is for the critical movement in South Asia. Alternate non-Western systems of thought are available and alive although they do not enjoy as much prestige as their Western counterparts. Besides, they are often interwoven with social structures which allow different approaches to development (as Chipko and Chandi Prasad Bhatt's experiments have shown).

The author's recommendations for a new antinuclear policy can be understood as advice to any social activist. He outlines this policy as :

- * reflecting and understanding of the relationship between people's feeling and their political actions
- * showing respect for people's personal feelings
- * never ruling out any human impulse as irredeemably bad
- * doing less moralizing and more analyzing

- * working to change discourse patterns
- * striving to keep the cultural discourses going in **order** to allow new ideas and solutions appear.

Perhaps Smith's suggestions - after an analysis as profound as this book - seem to be rather vague. But, then, what do we expect from an effort to understand the nuclear problem? A research book like this cannot do more than offer a new viewpoint to those actually working in the field. They will enjoy the sharpness of Smith's thought as well as his moral awareness. Hopefully they will also profit from the stimulation that this book provides.

Jelf Smith

UNTHINKING THE UNTHINKABLE :

Nuclear Weapons and Western Culture

Indiana University Press (1989)

LETTER BOX

Dr. Shivaram Karanth had offered himself as an independent candidate for the Karwar Lok Sabha constituency during the recently concluded elections. His campaign was actually a campaign for environmental education of the people. Though he lost he did receive nearly 60,000 votes. The voters of Uttara Kannada district elected for the third time running a most selfish and inactive person.

On the 21st of December, 1989, there was a "human chain" formed around the office of the Assistant Commissioner at Sirsi! as part of the agitation to stop the nuclear power plant at Kaiga. Nearly thousand people joined Dr. Karanth in forming the human chain which continued around "Bidki Bail" - which is a ground for public programmes in Sirsi. The human chain was to celebrate 200 days of "Saradi Upavas Dharani" (relay hunger strike) against the Kaiga plant.

A signature campaign against the continued construction of the plant was launched. The first two persons to sign the petition, Shri Bheema and Shri M.L.Hegde, did so with their own blood. Both of them had participated in the Dharani for all the 200 days. Smt. Vasanti Hegde, the president of the Sirsi Parisar Samiti and a member, of the Zilla Parisar Samiti said that if the government did not care for peaceful agitation, it would have to face the consequences of its undemocratic behaviour.

Same evening there was another programme in Ankola town. It was attended by thousands of people. Ankola Parisar Kuta was inaugurated by Dr.

Kusuma and a lamp for the preservation of the environment was lit by Dr. Karanth. This town has a great tradition of struggle during the freedom movement. Dr. Shivaram Karanth recalled the great history of this taluka and asked the people to fight unitedly to protect mother nature for future generations and for innocent plant and animal life who too has equal rights on this earth.

Dr. Kusuma

Snehakunja, Kasarkod, Honnavar Taluka
Uttara Kannada Karnataka 581342

During my visit to Lahore, Pakistan last month I met Dr. Zafar Omer, a consulting physician, who made a strong plea for curbing nuclear arms race in the subcontinent.

Although the occasion was India-Pakistan Environment Conference, there was strong expression of a felt need for peace and amity between the two neighbours so that resources could be saved and put to more constructive, regenerative use. I think you will agree that in this region there is socio-cultural basis and geo-political necessity for ending the cold war and moving towards peace. It may be worth thinking about a two-country Citizens' meet on the issue of nuclearization and its dangers.

Kishore Saint,

Ubeshwar Vikas Mandal,
10-G, Fatehpura, Udaipur 313001

I have been receiving Anumukti and I read every word of it. On the one hand, it makes me sad to see that India is following the same path that the West has followed, without learning anything, not even from their accidents and failures; and on the other hand, I find it encouraging that people like you are fighting this monster and devoting your lives for it.

It is not just Anumukti that we have to fight for (or for that matter we can hope to get); it must be total freedom from the clutches of materialism. After all, nuclear power and nuclear weapons rest on a psychological mindset called materialism - aggrandisement of goods and attachment to goods and therefore denial to others of their rightful share, in other words, selfishness. In my view the only way it can be achieved is Gandhiji's "non-cooperation with evil." In this case the evil is the power company and the government. So, people should simply not use electricity generated in nuclear power plants and also not buy goods produced by using such electricity. But that means, being prepared to live simply and having to take control of their own lives. That's

asking big!

Ashok Shimpi

4419 SW 23 St. Topeka,
KS 66614 U.S.A.

There are plans afoot to observe January 19th, 1990 as 'Protest Day' demanding a ban on continuation of nuclear activities. India week of 23rd to 30th December, 1989 has published a detailed account of uranium mining at Jaduguda and the Nuclear Fuel Complex at Hyderabad.

Dr. Dharendra Sharma

M-120 Greater Kailash-I
New Delhi 110048

Thank you for Anumukti. It will be very helpful for us to know about what is going on in India, because there is virtually no information on the Indian situation. I am especially interested in knowing about antinuclear protest. Is the antinuclear movement very big in India? How many people are there against nuclear power?

I am also involved in the food irradiation issue and if you are interested, I can send you a small booklet on the Japanese situation.

Yurika Ayukawa, Citizen's Nuclear Information Center, 3f Watanabe Building, Higashiueno 2-23-22, Taito-ku Tokyo 110 Japan

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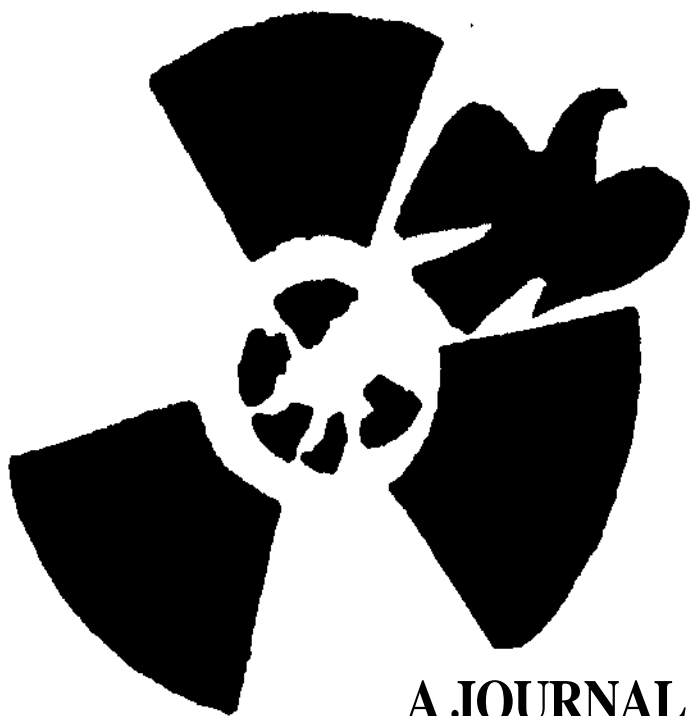
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ANUMUKTI

A JOURNAL DEVOTED TO NON-NUCLEAR INDIA

Volume 3 Number 5

April 1990

When I decided to give up a career in physics and take to full time antinuclear activism, many of my physicist friends were sceptical. Not that my career was any great shakes, but still it did provide the daily bread. "All that you really need to do is to take a few months off and write down clearly all the arguments against nuclear power and then convince the policy makers about them. After all what you are saying is not something radically new. Other countries are in the process of abandoning nuclear power and anybody reasonable can see the force of these arguments", so went their plea.

No doubt, physicists are somewhat naive when it comes to predicting the 'real world'. But to-day, four years later, even my friends are convinced that it is not mere sweet reasonableness which is going to drive out nuclear power or any other anti-people technology from this land. Is *Anumukti* then doomed to failure? A battle for a cause already lost!

No, because there is a language that policy makers do understand—the language of organised mass protest. And it is heartening to see that protest is beginning to bloom everywhere. In Eastern Europe it has blossomed like a desert flower after rains. Old, long hidden, skeletons have come tumbling out of nuclear cupboards as freedom, the right to know, accountability of public officials, become the key words in the new order. It seems increasingly likely that nuclear power has no future in that part of the world. Already a number of projects have been postponed, cancelled or abandoned unfinished as a direct result of public agitation.

At home too, people are becoming aware of the fact that without protest, survival itself becomes difficult. It is a hopeful sign that activists in Kerala have already started organising in response to the nuclear lobby's Interest in the State. The victory at Kothamangalam needs an encore. But what is especially encouraging is the fact that even at Rawatbhata in Rajasthan—the site of India's first CANDU reactors—that people have realised the false promise of the nuclear future. The moment of waking heralds a new dawn.

Kakrapar to Rawatbhata Cycle Yatra

Sampoorna Kranti Vidyalaya, Vedchhi is organising a cycle rally from Kakrapar to Rawatbhata to commemorate Chernobyl accident and as a mark of protest against the continued government support to antipeople nuclear policies. The rally which would commence on April 10th, would mainly pass through adivasi lands of Gujarat and Madhya Pradesh and reach Rawatbhata on April 24th in time for the antinuclear convention being organised there. On the way there would be a large number of small public meetings at which participants would try to raise public consciousness on the nuclear and other 'development' issues. Attempts would be made to make contacts with individuals and small grass-roots groups so that an effective organisation can be built for the future.

The rally will focus attention on four main themes:

(1) Nuclear energy has proved to be neither safe nor clean nor cheap. Recent findings in other countries (BEIR V-report, Sellafield leukaemia clusters, privatisation fiasco in U.K. etc) just show that nuclear energy is an even bigger failure than was apparent even a few years back.

(2) Although the rationale behind installation of a nuclear facility is local development - it is precisely

the 'locals' who don't develop. Thus, even after 17 years of an operating reactor and almost 30 years after the decision to build the plant was taken, people who live in villages surrounding Rawatbhata Atomic Power Plant (RAPP) have yet to receive electricity, drinking water or basic emergency medical services from the plant.

(3) Big dams - besides causing large scale environmental degradation themselves - are precursors of atomic power projects. This has happened at both Rawatbhata (Rana Pratap Sagar dam on river Chambal) and Kakrapar (Ukai dam on river Tapi). The new proposed dams on the Narmada too - despite all protestations regarding fulfilling the drinking water needs of thirsty people of Kutch and Saurashtra - would no doubt be strong attractors for a future nuclear power plant.

(4) All over the world nuclear power has paid special 'attention' to indigenous populations. Whether it is uranium mining, or location of nuclear installations or nuclear weapons (peaceful nuclear device) testing, it is the indigenous people who bear the greatest risk and get the least benefit. The route of the rally lies mostly through adivasi land to highlight this injustice.

Singing a New Tune

A report by the National Research Council of the US National Academy of Sciences (NAS) has concluded that the risk of exposure to low levels of radiation are at least four times — and in some cases, up to 14 times — greater than previously acknowledged by most radiation scientists. The long awaited *Biological Effects of Ionizing Radiation* (BEIR - V) report, released late last December, confirms the view held by dissident scientists. Mainly, that there is no safe dose of radiation and that the risk of radiation exposure follows a linear model. The report's findings are expected to lead to new standards for workers in the nuclear industry worldwide.

In 1980, the Academy's *BEIR-III* report had adopted a "linear- quadratic model", which presumed that low levels of radiation offered little to no risk. BEIR-V report is based on more recent data about the amount of radiation released by the atomic bombs dropped on Hiroshima and Nagasaki, which was considerably less than previously believed, and

also on the fact that bomb survivors are developing cancers at much higher rates than projected by *BEIR-III*. The report is a step in the direction of vindication of such antinuclear pioneers as Drs. Rosalie Bertell, Alice Stewart, Irwin Bross, Thomas Mancuso, John Goffman, Earnest Sternglass, the late Karl Z Morgan and many others much of whose work had previously been ignored or ridiculed by the nuclear establishment.

Using new information the report concludes that the risk for solid tumour cancer is three times greater than previously believed while the risk for leukemia is four times greater. The report also found a much greater risk of mental retardation among unborn babies exposed to low level radiation during the eighth to fifteenth weeks after conception. The report found that women are slightly more likely than men to develop cancers from low levels of radiation and that in some type of cancers, children are more susceptible than adults.

The BEIR-V report also concluded that normal background radiation poses a cancer risk up to 14 times higher than acknowledged in BEIR-III. According to the report, between 520 and 600 fatal cancers will be caused by lifetime exposure of 100,000 persons to 100 millirems annually - an average background dose. BEIR-III had predicted that only 25 to 119 fatal cancers would develop. However, BEIR-V only measured fatal cancers; the risk of developing non-fatal cancers is another 50% greater.

The panel was not charged with making public policy recommendations based on its conclusions and it did not attempt to do so. But Warren Sinclair, president of the US National Council for Radiological Protection, the panel which sets radiation exposure limits in the US, said that "present occupational limits will very likely be reduced" because of BEIR-V. There will most likely be an even more drastic reduction when a future BEIR-VI takes into account the recently released data on the

500,000 workers in the US Department of Energy's nuclear weapon's facilities.

Meanwhile Back Home....

The Atomic Energy Regulatory Board (AERB) has cautioned against the abnormal increase in the total radiation exposure at almost all nuclear establishments in the country. Prof. A.K. De chairman of AERB, said that the Board's Safety Review Committee had noticed that the total radiation exposure at nuclear power stations had gone up to 1,700 man-rem. It has asked the stations to bring the figure down to around 1,000 man-rems. Each individual should not be subjected to more than one rem of radiation. In 25% of the cases at Rawatbhata (RAPP) and Kalpakkam (MAPP), the reading had gone up to 2.5 rems. Recently RAPP was shut down for a few days as a result of increase in radiation in take.

Source: Indian Express 11.3.1990

Conscripts Construct CANDUs

The world knows that the regime in Romania led by the late Nicolae Ceausescu was founded on brutal repression and routine violations of human rights. Since Ceausescu's execution, it has also become clear that Canadians played a role in that repressive regime through the deals made by Canadian government agencies to build CANDU nuclear reactors in Romania. Forced labour has

been reported on the construction of Canadian CANDU reactors in Romania, and Canadian External Affairs officials admitted that they had previously received reports of conscripted labour being used at the nuclear megaproject. It seems that "commercial considerations caused countries such as Canada to overlook Ceausescu's villainy."

Canada began negotiating the sale of these

reactors in 1967. By 1977, Canada was reported to be close to an agreement with Romania for the construction of up to sixteen reactors. That same year, Canada and Romania signed a nuclear cooperation treaty that included nuclear weapon non-proliferation safeguards. In July 78, an agreement was signed covering the engineering services for one reactor, and by October that year, Atomic Energy of Canada Ltd. (AECL) announced that Romania



had agreed to buy two reactors and most of the heavy water needed to run them. In August '83 construction on two reactors began at Cernavoda, a small city on the Danube River, close to the Black Sea.

In retrospect, barter trade arrangements, negotiated to allow Romania to pay for reactor parts without currency, may have contributed both to the hardships that Romanian workers have endured, and to predictable financial losses for certain Canadian manufacturing industries. While most Romanians were chronically short of clothing and food, and living in dwellings with only minimal heat, Romania was exporting millions of dollars worth of garments and food products to Canada. These goods were apparently sold at bargain prices across Canada, thus undercutting comparable Canadian-made items. Romanian plate steel, imported under the same conditions, is reported to have cost Canadian steel companies in excess of \$10 million in lost sales. Most Canadian nuclear suppliers, with the exception of AECL, took 100% counter-trade on all their sales to Romania. Romanian steel plates that were part of the trade deal eventually became subject to Canadian dumping tariffs.

An independent study of AECL's commercial transactions, published in 1987 by the Economic Council of Canada, confirms that the crown corporation's export history has not been profitable. It was estimated at that time, that AECL had cost federal taxpayers \$12 billion (1981 currency) since its inception. Clearly, AECL's difficulties in selling

CANDU reactors abroad, and the Canadian nuclear industry's fears of financial collapse were prime factors in this highly questionable deal with Romania. Unfortunately, the Romanian workers, upon whose industrial production the deal was founded, were a captive and impoverished workforce. Canadian officials did not let the prospect of Romanian deprivation affect their willingness to do business.

The deal with Romania covered not only the construction of nuclear reactors, but also the transfer of nuclear technology, and the proposed sale of heavy water. At each successive stage, this deal brought Romania closer to having the capacity to produce nuclear weapons. As Romania became increasingly unstable in the 1980s, the risk this deal posed to international security should have been clear to Canadians. Concern was highlighted in 1985, when AECL signed an agreement that gave Romania the right to re-sell CANDU components to other countries, thus increasing the risks of horizontal nuclear proliferation. With Romania now in a politically volatile state, it is difficult to predict whether construction on the CANDU station will continue and if non-proliferation agreements will be adhered to by the new Romanian government. The Romanian election, to be held in May, will no doubt bring more news about whether construction of the five reactors at Cernavoda will continue or not.

Rod MacLeod

Nuclear Awareness News Winter 1989/1990

Chernobyl—The Sad Saga Continues

Between 1987 and 1989, a further 150,000 people (in addition to the 135,000 people evacuated at the time of the accident) were evacuated from contaminated areas in the Soviet Union. They had accumulated high doses of radiation through continued exposure to the fallout from the 1986 disaster. Another hundred thousand more people can expect evacuation between 1990-1992, when they approach the already too high emergency permissible radiation limit. At least 60,000 people mainly young persons and professionals have already left the areas without waiting for compensation or official resettlement. More than 220 villages have been already abandoned and some 600 villages and towns were included in a programme of systematic decontamination.

In 1989, it was officially acknowledged that an area of about 10,000 square kilometres in various parts of the Ukraine, Byelorussia and the Russian SSR was contaminated with cesium-137 to levels

higher than 40 Ci/square km and was considered dangerous for human habitation. About 150 villages are now waiting for the next wave of evacuation. In some still inhabited "hot-spots", levels of radioactive cesium as high as 90 — 140 Ci/square km have been found. The local population, particularly children are already suffering adverse health effects.

A significant part of the heavily contaminated area is far from the reactor site - in some cases between 100 and 400 kilometres away. High contamination was caused due to the fact that it rained on these areas during the time the damaged reactor was belching out radioactivity. Levels of cesium-137 between 15 and 40 Ci/square km were recorded over some 22,000 square kilometres during 1989. Western standards presently consider even 15 Ci/square km as unsuitable for agriculture, particularly livestock farming.

Some reports indicate that some 100,000 square kilometres of land in the European part of the Soviet Union has levels of cesium-137 and strontium-90 higher than 50,000 Bq/square metre. However, these rural areas and even those with contamination levels above 500,000 Bq/square metre, continue to be farmed although the agricultural produce from there is required to undergo special treatment. According to the regulations, livestock must be transferred to clean feeding about two months before slaughter. Milk is used only to make butter and cheese. But because of food shortages, violations

of the rules are common.

Approximately one million people live in areas now designated as "permanent strict radiation control" areas. The Ministry of Health has raised the maximum permissible limit of radiation dosage in these areas far above internationally recommended limits.

Sources: The Environmental Destruction of the Soviet Union" Zhores Medvedev The Ecologist Vol.20 No. 1 January 1990.

Rawatbhata : Development Brings Dissatisfaction

Rawatbhata near Kota in Rajasthan is being made into a large centre of nuclear generated electricity. The construction of the first reactor started in the sixties and by late 1973 the reactor had begun commercial production. The second unit commenced production on 1st April, 1981. Construction of the third and fourth unit has already begun and four more units are proposed. All these units are situated on the banks of the Rana Pratap Sagar dam reservoir. Within a 100 km distance three other dams have been built on the Chambal - the Gandhi Sagar dam, the Jawahar Sagar dam and the Kota barrage which together form the Chambal valley plan. All the dams produce hydroelectricity besides providing water for irrigation through a network of canals. On the top of this there is a thermal power station in Kota. A number of large industries have already started functioning there. One would expect that with so many 'temples' of modern development all concentrated in one place, the people of this region would be contented, happy and staunch supporters of the 'development' process. In fact before reaching Rawatbhata this is precisely the impression one gets - where once there was a jungle in which tigers roared, today there are new and newer colonies, shopping centers coming up by the minute. New buses run up and down Rawatbhata's roads.

But on January 13th, 1990, there was a meeting in Rawatbhata where an absolutely contrary picture emerged. This meeting had been called to discuss the benefits and the harm caused by the local nuclear power plant. It was attended by the sarpanches of two other villages besides Rawatbhata, a number of locally elected officials, farmers, tradespeople, unemployed youth besides some representatives from outside. In the meeting it became obvious that local people share feelings of disappointment, anxiety and anger and they feel that all these reactors, industries and dams have been of

no use to them.

The meeting was chaired by Shri Kishanlal Gupta the former chairman of Bhaishroad Panchayat and a resident of Eklingpura village. He said that the area was once a very good jungle and pasture land from which the local residents got various kinds of fruits, roots, leaves, wood, cattlefeed and other produce. The tornado of development has laid bare all this. The local residents have not benefited at all. Even today, most neighbouring villages do not yet have proper roads so that in an emergency the villagers could be taken elsewhere in a hurry. Although Rawatbhata is such a major electricity generating centre and supplies electricity to all parts of the northern grid, but the local farmers are still pining for electricity connections. He mentioned instances of farmers whose applications for electricity connections were still pending after ten years. In the same vein, the Rawatbhata village panchayat chairman Shri Ratanlal Gupta said, "The village Tamlav situated right next to the reactors is yet to receive electricity". There are also villages in the area where drinking water is still a serious problem and the water has to be carried in tankers during the summers.

Another fact which was illuminated during the discussions at the meeting was the discrimination practiced by the RAPP authorities between their own employees and the local population in matters relating to basic facilities. The local people have great difficulty in getting tap water connections. Even in cases of severe emergency, local people are not treated in the hospital attached to the power plant. This, despite the fact that there is no other hospital in the vicinity. In fact the government ought to set up a special hospital and health centres to deal with the damage caused by the radioactive pollution of the nuclear power plant. Even the sweat of the colony of employees of RAPP is allowed to flow freely through the localities posing a grave health

risk. The Rawatbhata village panchayat has drawn the attention of the authorities many times to these problems through correspondence and only received empty reassurances in return.

Expectations regarding jobs and other employment opportunities are naturally aroused in the neighbouring villages the moment a large project is announced. But most of the jobs go to the well educated from the cities and metropolis while only manual work is left for the local people. The same has happened in Rawatbhata. The unemployed youth in Rawatbhata have organised themselves into a union which has raised the demand of local employment. Two days before the meeting they had carried out a 'Rasta-roko' agitation. The chairman of the union Shri Rajesh Singh Rajora told the meeting in very clear terms, "We do not want any new reactors here - they are of no use to us."

There is a great deal of anxiety amongst the local population regarding radiation hazards of nuclear power plants. The disasters of Bhopal and Chernobyl are particularly to the fore in peoples minds. There is no information regarding what kind and amount of damage an accident can cause; what to do in the event of an accident; what are the possibilities of an accident at Rawatbhata; what are the emergency plans of the authorities etc. On none of these points have the authorities been forthcoming with information. About one and a half years ago an exercise was carried out to test emergency preparedness. However, since the authorities have always maintained that an accident was impossible, the local residents wonder why the need to have emergency preparedness drills. Last September there was a gas leak in the heavy water plant which caused a great deal of panic in the area. The security guards and the employees had decamped wearing masks in trucks. The residents of Tamlao village had also felt the smell of the gas. But the authorities have tried to cover-up this incident calling it a rumour. Due to this their credibility has reduced greatly. Any criticism of the atomic energy programme is labelled by the authorities as the work of foreign inspired people who want to weaken the country. There was a consensus at the meeting that the authorities have no other excuses left to offer. Ratna Mathur, who had come from Delhi said that the reality was just the opposite. Prosperous countries are cutting back on their nuclear programmes under the pressure of public opinion generated by Chernobyl. Hence there is a maximum pressure from

A "Parmanu Pradooshan Sangharsh Samiti" to fight against the radiation pollution caused by nuclear power plants both operating and proposed in the Rawatbhata area has been formed. The samiti has decided to commemorate Chernobyl day by calling a two day convention on April 25th and 26th, We invite friends and workers from other regions to come and join us. There are regular buses every hour from Kota to Rawatbhata starting from Gumanpura bus-stand between 7 A.M. and 10 P.M.

Contact: Shri Ratanlal Gupta — Sarpanch Rawatbhata Panchayat.

them on the Third World nations to accept the useless technology, hardware, instruments, etc. which they want to dump.

Authorities also claim that whatever the dangers involved, electricity is necessary for progress. But as one person said in the meeting, "There can be no development at the cost of human life." Rajeev Singh from Delhi clarified that the restart of Rawatbhata Unit 1 after there was a crack in the end-shield was not an achievement to be proud of but rather a crime against humanity considering the risk involved. Nowhere else in the world is a reactor with a crack in its end shield being operated. Sunil from Hoshangabad said that nobody could believe the authorities. They are going ahead with their programme despite growing protests only because their vested selfish interests are involved. They do not consider the local population any better than insects and treat them accordingly.

The slowly gathering storm of protest in Rawatbhata is about to break. The authorities of RAPP have started following a carrot and stick policy of simultaneously giving concessions and suppressing dissent. They have promised to make a junior college in Rawatbhata village. Shri Ratanlal Gupta, the Rawatbhata village sarpanch said that there was a proposal to supersede the village panchayat along with panchayats of another two villages and to incorporate them into a special development authority whose control would be exercised by a government appointed administrator. This way, the protest voiced by locally elected village officials could be silenced.

The meeting ended by forming a struggle council (sangharsh samiti). The samiti has decided to collect information on this issue and has called a conference on 25th and 26th of April, at Rawatbhata for this purpose. They want to establish a dialogue with other struggle movements and have invited representatives to come to the conference.

There is no doubt that modern development projects are raising anxieties and fears amongst the people not only at Rawatbhata. It is also apparent that the high priests of development have no answer to calm these fears.

(Translated from Hindi)

Sunil

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Radiation Kills Children of Nuclear Workers

An alarming UK study linking childhood leukaemia to fathers exposed to radiation has created furor in Great Britain and elsewhere. (See Box) The study found that children living in Seas-

cale, a village near the Sellafield nuclear reprocessing plant, were ten times more likely to suffer from leukaemia than children in the general population; one in five of the children with the disease studied had fathers who worked at the plant. The study, led by Professor Martin Gardner of Southampton University on behalf of the British Medical Association (BMA), was published in the *British Medical Journal* on 16th February, and was picked up immediately by the British media, making the front page of virtually every daily coming out of Britain and prompting calls for action.

The BMA study found an unusually high incidence of leukaemia among children living near the Sellafield plant in Cumbria, in the northwest of Britain, and provides the strongest link yet between leukaemia clusters with nuclear power facilities. Media reports are calling it the first study of its kind in the world, but in fact it is the latest in a long line of studies (most of which have so far been ignored) that show that radiation is

considerably more dangerous than what was assumed when the current safety standards were set. Where it differs from most other studies, though, is in the genetic implications: The study suggests that

Results of case-control study of leukaemia and lymphoma among young people near Sellafield nuclear plant in West Cumbria.

Results : Expected associations with prenatal exposure to x rays were found, but little information was available on viral illnesses. Relative risks for leukaemia and non-Hodgkin's lymphoma were higher in children born near Sellafield and in children of fathers employed at the plant, particularly those with high radiation dose recordings before their child's conception. For example, the relative risks compared with area controls were 0.17 (95% confidence interval 0.05 to 0.53) for being born further than 5 km from Sellafield, 2.44 (1.04 to 5.71) for children of fathers employed at Sellafield at their conception, and 6.42 (1.57 to 26.3) for children of fathers receiving a total preconceptional ionising radiation dose of 100 mSv or more. Other factors, including exposure to x rays, maternal age, employment elsewhere, eating seafood, and playing on the beach did not explain these relationships. Focusing on Seascale, where the excess incidence has predominantly been reported, showed for the four out of five cases of leukaemia and one case of non-Hodgkin's lymphoma whose fathers were employed at Sellafield and for whom dose information was obtained, that the fathers of each case had higher radiation doses before their child's conception than all their matched control fathers; the father of the other Seascale case (non-Hodgkin's lymphoma) was not employed at the plant. These results seem to explain statistically the geographical and employment associations with Sellafield that were found.

Conclusions : The raised incidence of leukaemia, particularly, and non-Hodgkin's lymphoma among children near Sellafield was associated with paternal employment and recorded external dose of whole body penetrating radiation during work at the plant before conception. The association can explain statistically the observed geographical excess. This result suggests an effect of ionising radiation on fathers that may be leukaemogenic in their offspring, though other, less likely, explanations are possible. There are important potential implications for radiobiology and for protection of radiation workers and their children.

British Medical Journal 17 February 1990

radiation at Sellafield effected the sperm of men working there, possibly introducing a genetic mutation. It found that where workers received only 10 mSv in the six months prior to conception, their children also faced a 6-8 fold increase in risk of developing leukaemia. (The current annual dose limit is 50 mSv). It is not, however, the first time that damage to sperm has been linked to radiation. For example, according to Greenpeace, genetic implications of radioactive exposure on nuclear submarines were revealed in a study which showed that between 1972 and 1975 four babies born to submarines on the Polaris submarine HMS Resolution were born with hare lip and cleft palate. In 1986 Dr. Maha Linet, then at Johns Hopkins University in Baltimore, looked at 309 cases of childhood leukaemia in Shanghai. She and her Chinese colleagues found that the disease was more common in the children of men who had diagnostic X-rays before conception than in those of men

who had not. The risk of cancer increased with the number of X-rays that the men had been given. Similarly the fifth report of the *Biological Effects of Ionising Radiation series* (See also "Singing a New Tune" page, this issue) describes Japanese research which shows that two out of the 1,630 women pregnant at the time of the atomic holocaust gave birth to children who subsequently contracted childhood cancers. Normally fewer than one in 1,630 would be expected.

The scientists in the BMA study found that of 52 local children who had leukaemia between 1950 and 1985, 10 had fathers who worked at Sellafield. The link was strongest where the father had received particularly high doses of radiation before the child's conception. Scientists and engineers at British Nuclear Fuels (BNFL), which runs the Sellafield plant expressed "deep concern" and called for urgent action to reduce radiation dose limits for employees. At the same time, however, BNFL said that while the report came from a "respectable source", it did not believe it established a link between radioactive discharges from the plant and childhood leukaemia.

Workers at Sellafield were told about the findings before they left work on the day before the study hit the front pages. Shop stewards began considering their response that night, but already the Transport and General Workers Union, on behalf of the industrial unions in the nuclear industry, a/e calling for urgent action. On March 6th three families, in which the father works at Sellafield and the children have cancer, served writs on British Nuclear Fuels as a result of this study. Martyn Day, solicitor for families claiming that their children were

The discovery of a clear statistical link between the exposure of men to excessive radiation and leukaemia in their children is a calamity of dreadful proportions for those directly affected. The anguish of a father of a child suffering from this serious and sometimes fatal disease will be increased immeasurably by the suspicion that the origin of such suffering may after all be in himself. Such families need and deserve all the support and sympathy a compassionate society can muster. So serious are the implications of this discovery that the only sound basis for public policy in response must be to act as if the suspicion was already proved. Further research is essential, but it must not be used as an excuse for delay. The investigation by Professor Martin Gardner of Southampton University is evidence enough for action. It is already being hailed as a model of its kind, and may become a classical demonstration of the detective power of environmental epidemiology, the science of investigating statistical patterns of disease in pursuit of clues to medical causes and effects.

The implication must be faced, painful though it is, that any man who has been exposed regularly to radiation in the course of his employment may run some risk of fathering children who may eventually contract leukaemia. One of the first priorities of research must be to identify that group at risk as accurately as possible, for there must be thousands of men whose work brings them into contact with radiation who will today be fearful about their own families. They need reassurance as fast as it can be obtained, based on solid scientific investigation. Meanwhile the entire nuclear industry is faced with a real emergency. Radiation safety levels will have to be reviewed once again, and almost certainly substantially lowered. This is also a case where it will be not sufficient to await the final dotted T or crossed T in the laboratory, but where the only right basis to proceed for the time being will be to assume the worst.

The Times (London) 16.2.1990

made ill by radiation, said that already half the children involved were dead. Susan D'Arcy believes that her daughters leukaemia is directly linked to the Sellafield plant. Her daughter Gemma, is one of the three children in one school to have contracted the cancer in the last two years. The other two children died. Gemma who is six years old, is at present in hospital following a bone-marrow transplant. Gemma's father, Stephen D'Arcy, has refused to support his wife's test case against BNFL saying, "It's a bit like biting the hand that feeds you." BNFL employs around 33% of the population of the area. At Sellafield alone, there are some 14,000 people working at the plant, and thousands more depend on it for a living.

In a follow-up story on the study on Sunday after it was released, *The Guardian* ran a headline saying "Cumbrians Calm on Sellafield Report". But the article itself contradicted this. One person interviewed, Christopher Merlin, who had already begun a lawsuit against BNFL after plutonium from the plant was found in his household dust, predicted it would have a "disturbing effect on marriages in the area." Another man said, "I would be worried if I were starting a family. I've worked there for four years." Even a woman who said, "yes, people were taking it calmly and there was," she thought, "no panic", went on to add, "Yet I think young people are bound to think twice about whether there is any risk." Let's hope the authorities who set dose limits think twice, too.

Source: WISE News Communiqué 326

The Economist March 10, 1990

Peace News February 23, 1990

Events

Talk by Dr Rosalie Berteli

On 28th February, 1990 a lecture on the "Health Hazards of Low Level Radiation" by Dr Rosalie Bertell was organised in the Indian Merchants Chamber Hall in Bombay. The organiser was F.I.A.M.C. Bio-Medical Ethics Centre of Bombay. The lecture was co-sponsored by a number of organisations including *Anumukti*. Dr Biswatu Banerjee a physicist from Tata Institute of Fundamental Research presided and Mr Justice Y.V. Chaudrachud - the former Chief Justice of India was the chief guest. The lecture was attended amongst others by many scientists, medical personnel and journalists.

Dr Rosalie Bertell who is the author of *'No Immediate Danger — Prognosis for a Radio-active Earth'* is a very famous figure in antinuclear circles all over the world. Two years ago she was awarded ^M"The Right Livelihood Award" — the "Alternative Nobel Prize" for her pioneering work on effects of low level nuclear radiation. She has been a fighter for human rights especially for the rights of the weak and the dispossessed. Trained originally as a statistician she presently is the President of the International Institute of Concern for Public Health. She has a special relationship with India since she is involved in a long-term study of the effects on the naturally occurring (high) low level radiation in the monazite sands of Kerala.

During her talk she sighted many studies in which she herself had been involved to stress the pernicious nature of low level radiation. The point she stressed was that increasing radiation pollution is a form of random murder. What we are actually doing is to deplete the strength of the gene-pool. In the long run we will be producing children who are less able to cope with pollution than were their parents while at the same time we're degrading the environment so that they have more to cope with.

Of special interest were her preliminary findings of the study of 40,000 fisherfolk and a comparable control group living on the sands in Kerala. She confirmed that there had been an increase of three to four times as much in congenital diseases like epilepsy, cleft lip and palate, infertility, Down's syndrome etc.

She also talked on the role of standard setting bodies like ICRP (International Council for Radiological Protection) which though they recognise the various ill effects on biological systems of

radiation like injuries, general lowering of W.B.C. counts, cataracts, obesity, impaired fertility, shortened lifespans, increases in cardio-vascular-renal diseases as well as in autoimmune lymphoid diseases; only take into consideration fatal tumours while setting standards.

Medicos Say No to Nuclear Energy

Medico Friend Circle (MFC) in its XVth annual meet on "Radiation and Health" held at Gandhigram Rural University from 26th to 28th January resolved to oppose the production and use of nuclear energy as being too hazardous for the health of human beings and to demand that existing nuclear facilities be de-commissioned and no new nuclear plants be built.

The discussion in this meet was divided into four broad areas:

- 1) Basics of radiation and health and the experience of nuclear power plants;
- 2) Health-hazards of common radiological investigations;
- 3) Food irradiation;
- 4) Other sources of radiation from consumer products - Electronic Display screens for instance.

Most of the discussion and background material was focussed on the first area; a clear consensus also emerged.

During this discussion, it was pointed out that authorities all over the world have concluded that the quantum of radiation, how so ever small, invariably cause damage to human issues and that there is no level of radiation that can be considered safe. Production of nuclear energy damages the health of the people through exposure to ionising radiation at all stages of operation. Mining and milling, transport of radioactive material, burning of nuclear fuel in the reactors etc. cause radioactive contamination of the environment. There is enough scientific evidence to this end. Moreover what is of grave concern is the nature of the health hazards caused by ionising radiations which could to the foetus, genetic mutation after many generations and would be carried over to future generations as well.

The MFC meet underlines the special significance of these health hazards which would affect the very quality of human race in the future generations to come. Added to this is the predicted adverse effect on the power to resist infectious organisms and other stresses. These alarming health hazards

are reasons enough to outright reject nuclear power.

The participants of MFC meet emphasised that apart from these major health hazards, there are many other important health problems like increased incidence of allergies, asthma, high blood pressure, hypothyroidism, reduced fertility, spontaneous abortion etc. Thus on health grounds alone, nuclear energy is to be rejected in absolute terms with little need to base our judgement on the comparative analysis of health hazards of different sources of energy. Any source of energy which threatens the very survival and quality of human species has to be rejected and human society must find a model of development compatible with safe energy sources. During the course of the discussion it became clear that the health hazards of nuclear energy cannot be minimized despite claims to the contrary. Above all, the problem of safe disposal of radioactive waste for thousands of years has yet to be solved.

Today, nuclear energy constitutes only 1% of total electricity produced in India, shutting down of nuclear power plants will thus not result in a crisis on the energy front. The 1% deficit for which the nuclear energy is being produced can easily be overcome by saving electricity losses in transmission.

The MFC meet has also drawn attention to the health hazards of repeated exposure of pregnant women for prolonged periods to visual display terminals (Screens) attached to Computers.

The MFC meet, while affirming the well established immense value of radiological investigations has drawn attention to the fact that additional cancers do in fact occur due to exposure to X-rays. The incidence of additional cancers is extremely low and depends upon the age, sex of the person exposed and the quality of radiological apparatus. It has been estimated that in case of adult male persons exposed to these X-rays, there would be 15 additional cancers per million X-rays. Compared to the number of lives saved and diseases diagnosed this risk is extremely low. But nevertheless it follows that X-rays must be kept to as minimum as necessary and secondly all the precautions necessary to maintain the X-rays units properly have to be meticulously followed. On both these counts the situation in India especially in Taluka places etc., is much worse than in the developed countries. Screening machines are much more hazardous because their exposure is many times more and hence it should be restricted

to the absolute minimum. Atomic Energy Regulatory Board must exercise its powers to regulate the quality of radiology units.

War Resisters Meet

The regional conference of the War Resisters India (West) took place at the Sampurna Kranti Vidyalaya in Vedchhi between 10-13 March 1990. It unanimously adopted the following resolution:

"We the peace activists and constructive workers of the western part of India are deeply concerned about the increasing violence and militarisation in the subcontinent. We firmly believe that it is our responsibility to take such steps that would help in bringing about mutual understanding and peaceful relations between the peoples of this region. Our objective is a world without war, and it is with that spirit that we state the following:

"As the Indian government has repeatedly stated that it is committed to giving priority to friendly relations with her neighbours, we are disturbed to learn now that the Prime Minister has announced an increase in the defense budget whereas the general trend the world over is towards reduction of arms. Therefore, we urge our government to start cutting military expenditure in order to build confidence in South Asia."

"Some recent statements by the government referring to its intention to go to war if necessary as well as the appointment of a defense minister who is a strong protagonist of nuclear weapons are not in keeping with the spirit of the processed policy of reconciliation. This has only served to vitiate the atmosphere in the region.

"We welcome the announcement that at last the Indian troops will now be withdrawn from Sri Lanka and we hope that in future no action will be taken which may be considered a further interference in the affairs of Sri Lanka and for that matter any neighbour country. The future of the people of this region is closely linked with the availability of water. This should encourage the governments to find amicable solutions to water disputes, for example sharing of Ganga waters between India and Bangla Desh."

"We on our part attach the utmost importance to these issues and are determined to continue our struggle for peace and friendship with our neighbours. We hold that the future of India is linked with the future of her neighbours."

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A Passing Opportunity ?

Energy situation in the GDR and future possibilities

Times are changing rapidly in Eastern Europe. Today, policies regarding the future are no longer decided by a small group of rulers. The people have demanded their rights and soon in all Eastern European countries there will be elections. The tasks of the new governments in the fields of environment and economy will be hard.

The former government of the German Democratic Republic has left an economic and environmental disaster behind it.

In the south of the GDR lie brown coal deposits. It is the only raw material available in the country for energy production. The quarrying of this has destroyed the surrounding area completely. In 36 coal-mining districts 320 Mio tons are quarried per year. That is more than in any other country of the world. The cost to nature and to the population of the area are enormous: 3,000—4,000 ha dead landscape with huge craters is the result of one year's operations alone. 30,000 people have had to resettle, 75 villages have been exterminated, rivers, roads and railroads have had to give way before the gigantic quarrying machines.

70% of the energy supply in the GDR comes from this brown coal. In 16 mainly obsolete power stations more than 80 % of the delivery is burned. But the bigger part of this amount emits through the chimneys and pollutes the environment. There are no dustfilters, no installations to cut the sulphur dioxide emissions.

Sebastian Pflugbeil, member of the opposition group "Neues Forum" and a physicist says that three quarter of these power stations should be pulled down because they are in such catastrophically bad repair. He points out that the GDR has the third highest energy consumption per head in the world - a consequence of the old techniques besides the waste of energy everywhere.

So, what to do? The intermediate government had recently made first attempts for a change and reduced the mining of brown coal by about 50-70 Mio tons. But this alone can not be the solution.

In the Federal Republic of Germany the nucleocrats and businessmen of the atomic industry are already on the stage hoping to sell a product which has seemed to be "out" in their own country. In the West it has become more and more difficult to install new atomic power plants: the raised awareness of the population, the opposition movement,

the Chernobyl-accident, the increasing costs of this energy resource have all led to a situation where no politician wants to take the risk of ordering new constructions. Now the atomic industry sees its chance in the East. Talks between nuclear experts in the GDR and the West German companies have already taken place.

Today, in the GDR at most 10% of the energy output comes from nuclear plants. Five reactors are on line, four of which are Soviet 440 MW reactors installed at Greifswald. Three others near Stendal are still under construction after 17 years. Recently it has become known that there was a near core meltdown at the new fifth block of Greifswald in November 1989 and a very severe accident in 1976 (see following story).

There has hardly been any resistance against the reactors in the GDR. The pressure from security forces and the ruling party was too strong and the existing environmental groups were faced with more evident abuses: air pollution, dirty rivers and destroyed environment. But if the new elected government decides to extend the nuclear programme there will be probably be more turmoil - the government has to calculate that the times of a quiet citizenry have passed.

It is ironical that just the members of the former government party SED got support of the conservative federal government of West Germany on this issue. In the case of atomic energy the old rulers seem to be the most reliable partners for the western enthusiasts of atomic power.

The common man in East Germany would perhaps prefer some radiation to the terribly bad air but for the environmentalists and most of the opposition groups in the country the choice between the alternatives "brown coal" or "atomic power" is like "the choice between plague and cholera".

The environmentalists have other ideas about future energy politics: they want to overhaul the existing brown coal power stations, improve the industrial and household techniques and put the main emphasis on energy saving possibilities. According to Mr Pflugbeil an extensive energy saving programme is the solution because the opportunities to save energy are more than good. Besides, the brown coal resources are becoming less and less, their quality becomes worse and the quarrying gets more difficult. On the other hand the construc-

tion of new nuclear power plants takes a long time (about 10-20 years) - too much time and too much money for an economy in difficulties. The huge expenditures which are necessary for the construction of atomic power plants would divert money from more sensible and urgent activities.

On the 18th of March the first free election in the GDR have taken place. The conservatives have

won. This means that the unification of Germany will be quickly forced. Whether the new government with the help of the conservative government in Bonn will be willing to start a reasonable energy policy without nuclear power plants is now again in question. But, the environmentalists too will unite. And they have the better arguments...

Carolyn Bender, Bonn, West-Germany

Notice Board

"Safe Energy and Environment"

A new quarterly journal "Safe Energy & Environment" will be coming up from April, 1990.

In Calcutta, a citizen's convention on April 30, 1989, to commemorate the Chernobyl Day, stressed the need for an organised effort for the collection and dissemination of information on the dangers of nuclear power and people's movement against it in particular, and environmental and energy issues in general. The journal 'Safe Energy and Environment' is a step towards the realisation of the demand of the convention. At present, we are working with a handful of activists, greatly limited resources and a tiny network. What we want to make is a modest beginning. The future depends on your active co-operation and support.

Yearly subscription rate:

Personal Rs. 20/- ; Institutional Rs 40/-

*Contact: Pradip Datta,
Publisher Safe Energy & Environment,
28, Nazrul Park, P.O.: Aswininagar,
Calcutta-700059*

Trichur Antinuclear Convention

The recent session of the Indian Science Congress has endorsed the demand that two 500 MW nuclear reactors be located in Kerala. There is vigorous campaigning canvassing for it in the political arena also. Hence we are organising an anti-nuclear convention in Trichur on 26th April to inform the public and form a strong and united resistance to the proposed project.

*Contact: K. Aravindakshan
Walden Post Eravu 680620
Dist: Trichur, Kerala*

India's Nuclear Options

27,28 & 29 April Bangalore

The National Front government's budget provide for further increases in allocation for defense

and the Department of Atomic Energy.

When tensions are fast disappearing in Europe, in our region the threat of war and momentum towards the building up of large arsenals continues despite glaring poverty and unemployment. The basic priorities are side-stepped due to a misconception of our real security needs.

From time to time there are newspaper reports about exercising the nuclear option - pointing towards the alleged secret weapons programme of Pakistan, while conveniently overlooking the fact that the Minister of State for Defense, Dr. Raja Ramanna along with the present chairman of the Department of Atomic Energy was responsible for the 1974 Indian nuclear explosion.

In August the United Nations will be reviewing the Nuclear Non- Proliferation Treaty. What ought to be India's position on it?

SAARC has become a reality. But the peoples of South Asia are being kept apart - in the interest/defense of their nations.

When most countries with nuclear power as a major part of their energy source are abandoning nuclear energy, India is planning to expand in a massive way. This expansion involves abandonment of long professed goals of self reliance and importing of reactors from Soviet Union and France.

To discuss these and other related issues, it is proposed to hold a three day seminar near Bangalore at the Ecumenical Christian Centre at Whitefield. The seminar which will be residential is being jointly organised by the following organisations:

Documentation & Dissemination Centre for Disarmament Information, Bangalore;
Ecumenical Christian Centre, Whitefield;
Friends Rural Centre, Rasulia, Hoshangabad;
Institute for Development Education, Madras

*Contact: Hemachandra Bassappa.
21. Railway Parallel Rd.,
Nehrunagar, Bangalore 560020*

Will Koodankulam Be Known as 'Chernobyl South'?

On 24th of November 1989, Central Europe stood at the edge of a nuclear disaster comparable to the Chernobyl disaster of 1986. Recently released reports, suppressed by the East German authorities, reveal that a nuclear power plant in Greifswald suffered a near core melt-down.

In order to test the emergency switch-off system of the new fifth block of the reactor, three out of the six cooling water pumps were switched off. Instead of the expected automatic switch-off, the fourth pump broke down and the reactor went out of control. When the crew finally succeeded in switching the reactor off manually, ten fuel elements were damaged - a local meltdown. The triggers to the automatic switch-off were, according to an official investigating commission, sticky contacts of relays which were sloppily constructed, as was the rest of the Russian built reactor.

This accident is only the latest in a series of dangerous and highly dangerous incidents:

In 1974, only hastily spread jumping-sheet prevented some control rods from falling into the fully loaded centre of the reactor.

In the mid seventies all main water pumps broke down. Workers had forgotten to reinstall six small iron lids during a checkup.

In 1981, de-ionized water got into the active zone of the reactor. The speed of the fission reaction

increased and the temperature rose out of control.

In 1976, following a fire within the reactor, the complete cooling system of block 1 broke down. Only the coincidence that one of the six emergency cooling pumps was connected to the neighbouring reactor prevented a core meltdown.

The everyday conditions prevailing in the plant present an even more impressive list. The plant was kept connected to the grid under nearly all circumstances. Drunken staff, a leaking and unstable reactor building, paint covered finger-wide welding seams, missing containments, missing replacement and construction materials, chaos in cable connections, sinking foundations and radiation levels 10,000 times in excess of design specifications. In order to keep all these skeletons under cover, some 40 people from the Stasi (the dreaded secret police) were posted at Greifswald. Workers and staff were intimidated, while at the same time wages were twice as high as compared to other industries. For decontamination work soldiers were often used. Chromosome damage was discovered in six workers. Workers at the plant were conversant with its obsolete equipment that often broke down. Privately they referred to the plant as "Chernobyl North".

Editors Note: The reactors to be installed at Koodankulam are the very same VVER reactors as at Greifswald.

Reviews

Narora - The Untold Story

We have often lamented the paucity of information regarding the Indian nuclear programme. *Narora — The Untold Story* is an attempt to bridge this great chasm in information. It is published by the Network to Oust Nuclear Energy (NONE)—a group of young activists from Delhi who have made sincere efforts at educating public opinion by conducting slide shows and workshops in a number of colleges in Delhi, Aligarh, Bulandshahr and other towns surrounding Narora. This 24 page booklet contains many pictures of the people displaced by the plant and maps of the surrounding areas. The price at Rs 10 might seem somewhat excessive at first glance but as a small token of one's support for the movement it is indeed a very reasonable price.

Extract

Knowledge of the plant and of nuclear hazards

The knowledge the villagers have about the plant is partial and in many cases, distorted. Evidently, Those who bear the brunt of dislocation are not considered important enough to be briefed about the kind of work the plant does. Worse still, they have not been given any information at all about what they are to do in case of an accident.

Some who work in the plant have a clearer idea about nuclear energy. These are also the ones who mention accidents, and incidents of workers being exposed to radiation. We cannot verify these stories since the DAE does not give the public access to such information. However, we have retained reports of such incidents simply to point to the

workers' knowledge about the issues involved.

Name: Om Prakash, Village: Ramghat

They told us that electricity generated in the plant releases a poisonous gas. The gas will harm us, our grains will get spoiled, water will get affected, we will die..."

Name: Yadiram, Village: Ramghat

"Buffaloes grazing near the plant had died..."

Name: Rambharose, Village: Ramghat

"DM Sahib told us that gas will be released from the plant so we should leave our houses. What type of gas it is we don't know..."

Name: Kalawati, Village: Ramghat

"We were told that our grains will get poisoned, grass will dry up due to the poison, animals, plants all will die... But our cattle still graze near the plant. What to do? There is no other place where they can get anything to eat..."

Name: Kumkum, Age: 10 yrs.,

Colony: Bijaun Nayi Basti

"Our village has been abandoned, that is why we are here. A power house was being made there. When it started working, we would have died. My father told me this."

Name: Unknown (Woman),

Colony: Bijaun Nayi Basti

"They told us that a power house was being built. The electricity will be made from the rays of the sun god. What these rays are we don't know... We were told that if we get exposed to radiation our limbs will be deformed, or our babies will be born deformed. That is why we were settled 3 miles away from the plant..."

Name: Ramwati, Colony: Bijaun Nayi Basti

"We have not been told what we are to do in case of an accident in the plant. They said that if something happens we will be taken out of the area in buses."

Name: Jaisingh, Colony: Bijaun Nayi Basti

"...To make us leave the village they told us that there can be an explosion like Bhopal."

Name: Bankelal, Colony: Bijaun Nayi Basti

"Some men in the plant have got radiated. Pukhraj's whole body is useless. He becomes like a statue and starts shivering."

Name: Unknown, Colony: Ambedkar Basti

"In this plant, electricity will be generated through the eclipse of the sun and the gas which will be produced inside can harm us if it is released."

Name: Unknown (worker at the plant),

Colony: Ambedkar Nagar

"The boiler line taking heavy water to the turbine burst recently. We welded it... The plant was shut down for a month. When the Prime Minister came to inaugurate the plant it was not working..."

Many workers have died because of radiation. When the contractors get letters from their homes, they reply that these men have left the plant and their accounts have been cleared."

Name: Gulab Singh, Colony: Ambedkar Nagar

"I work in the plant, I do inspection work. When the plant starts, radiation can spread in the nearby areas and the villagers will suffer... because of radiation there can be a loss of blood in the body, pain in arms and legs and if a person gets a large dose of radiation he can die too... There are many labourers in the plant who do not know anything about radiation. .. one man got radiated and as soon as he stood up, he started shivering."

Name: Ranvir Singh, Colony: Ambedkar Nagar

"I have been working in the plant since the past 5 years... About a month before Rajiv Gandhi came here, there was a heavy water leakage. The heavy water was in a tank, which was opened by mistake. When we learnt about the leakage everyone ran away from there... There was no one in the control room... Finally to clear it up, labourers from outside were called in, on daily wages, they were paid around 20 to 25 rupees."

Name: Unknown (worker at plant),

Colony: Ambedkar Nagar

"When someone is exposed to radiation, then if he is normal he is put into hospital, if he is seriously affected he is put behind a glass sheet. If his family comes to see him, they look at him through the glass and come away."

Name: Unknown, Colony: Sundamagar

"We were told that the plant makes papads, and smoke comes out of these. This smoke can damage your eyes."

Name: Mir Kasim (worker at the plant),

Colony: Sundamagar

"The day after Rajiv Gandhi came to start the plant, there was a fire in part of the plant. I was working inside, welding something.. I came away. A friend who was there is in hospital now."

Strategy for Survival

"What is the relevance of a peace movement for India?" This was one of the most challenging questions during the recent regional meeting of the War Resisters of India in Vedchhi. The question was occasionally raised, but more often it was inherent in remarks concerning the priority of work on sustainable energies, organic farming, environmental protection, etc. "We have got so much to struggle within our daily sphere of work that there is little scope for a national or international peace initiative," was the consensus among some of the activists. Only slowly it became clear that exactly these daily struggles are steps towards a liberating peace.

Towards a Liberating Peace is also the title of a new book trying to provide a "coherent shared theory which illuminates hidden interlinkages in clear and understandable terms." An international team of scholars under the direction of social scientist Rajni Kothari and within the framework of the United Nations University's Programme on Peace and Global Transformation has prepared the study. It focusses on the issues of militarisation, worldwide economic crisis, conflicts over resources and human and cultural rights.

It is interesting to read the publication and to know more than the authors possibly could have known: The group's work was completed in 1989 and only the last months' developments have opened new perspectives on the dynamics of world history. Much of what is said in *Liberating Peace* anticipates the recent developments, for example the strong influence which consumerism exerts on non-Western societies, or the impossibility of maintaining economic and political independence in the neighbourhood of a superpower (see Nicaragua).

Other hopes for tendencies in favour of sustainable and peace promoting life styles have been disappointed, as for instance the defeat into near irrelevance of the ecologically and socially conscious dissidents in East Germany's polls or the rising conservatism and chauvinism in Europe and South Asia. The political and economic failure of the socialist systems, which the authors recommend as positive solutions to some aspects of the economic crisis, makes the reader doubt the assessment. But it is easy to know better now.

The book at times, reminds one of the style of the Brandt report: long enumeration of global problems and lists of recommendations for a re-orientation. Here the critical reader will not find much new information.

But the authors do more than that when they show how militarisation is one cause behind the distortion of the economy as well as of the political process. An elite which has accepted violence as a means to defend its way of life, would prefer to allot government funds to research and production relevant to the military not regarding their long term destructiveness. A large military apparatus, nuclear weapons and arms industry even in peace times breed secrecy and curtailment of civil and democratic liberties.

The authors demand a global reduction of military spending and arms production as the only way to counter the economic and ecological crisis. They point out that the North only can produce new weapon systems because the South buys its products and thus contributes to the market feasibility of the industry. However, one wishes that they also had discussed the contribution to the arms bazaar of countries like India, Argentina or South Korea.

Prof. Kothari's well-known pen is felt throughout the book: issues of peace and global transformation are analysed in relation to the role of the State. The nationalist State is denounced and hope is sought from efforts at the grassroots. If the movements give up their regional and national isolation they would be able to develop strategies for a transformation of the State. *Liberating Peace* is meant for them and hopefully would stimulate the discussion about the critical movement's role in politics and society.

Rajni Kothari, Richard Falk, Mary Kaldor, Lim Teck Ghee et al.

Towards a Liberating Peace

New Delhi: Lokvani: Tokyo :

The United Nations University 1989

LETTER BOX

There are just a few general remarks I would like to make about Anumukti. Of course the magazine is informative. The piece on the French nuclear programme was one such. But there are finer, more intangible reasons that speak for Anumukti. After all information can be gathered from other sources too.

Magazines like Anumukti are precious fragile things that need all the care that humanity is capable of mustering, to be bestowed on them. Anumukti's battle is a losing battle. I don't think that any government in the world either cares or dares to uphold environmentalism or denuclearisation against the claims of industry and capital, aided as both are by

science. This combine is ruthless and invincible I think, and it is going to see to it that it remains invincible. Power after all has never been given up for idealist or ideological considerations.

But every doomed battle represents a worthy cause. In today's world environmentalism has the only rhetoric that makes sense. All the known causes - culture, religion, nationalism, communism, feminism etc. -- are based on exclusiveness of one kind or another - geographical, territorial, sectional and so on. This kind of exclusiveness has become out of date in today's world of time-compressing locomotion.

Environmentalism has no totems. It upholds the biological foundation of life, in which every division brought about by man-made civilizations and cultures, disappears. We need this sweep of vision today, and the breadth and spaciousness it spells, to regain the wholeness taken from us by exploitative and undisciplined technological growth.

It is unlikely, as I said, that this vision and spaciousness will be given for the asking, or that they would pass into unconscious and established ways of thought and being or that they would ever be anything more than concepts. But that is precisely why Anumukti and magazines like it have to be supported. The saying of unrealizable truths is important. I would like to be amongst those who at least clap for the sayers even if they can't be sayers themselves.

Raji Narasimhan

B107 Gulmohur Park, New Delhi 110049

In the last issue of PPST Bulletin, there was a long article indicating that the Indian nuclear energy programme was costly, inefficient and made no provision for the disposal of wastes. I had sent this article to a friend of mine in the United States and he disagrees strongly with this view. (His comments are enclosed)

As you know this is a very disputed matter and it is not easy to understand, why when nuclear energy can save fossil fuel and is yet being followed all the world over, India should take a stand against its introduction and continuance. The late Sir Homi Bhabha, and our scientists like Dr Raja Ramanna and Dr Srinivasan also hold the same view. Perhaps you might like to consider all these facts and not take a completely one sided view of this disputed matter.

R.K.Patil

Civil Lines, Nagpur

I am from Kutch. Kutch is in comparison to other parts of Gujarat a very dry and thirsty area. To such an arid land the gift of water would indeed be a great blessing.

But our tiny planet Earth has suffered much from the degradations of the pleasure-seeking 'developers'. They have polluted entire creation and are still continuing to do so today. Any attempt to halt this plunder is welcome and those who raise their voice are only performing their sacred duty.

There can be honest differences of opinion on issues but amongst those who protest this terrible disbalancing of the harmony of nature there are many who are honest and pro-humanity. I myself personally know some of them.

I believe that seeing the high level of feeling raised on this issue let the dam be built and whatever

be the outcome we shall share the benefits and the harm equally.

But those farmers who shall be receiving water from the dam, why cannot the rich amongst them share half their land for those who are being displaced by the dam? It is only in this atmosphere of sacrifice that the passions of the protestors can be calmed.

The waters of the Narmada belong to the nation. It is only when their distribution is on the basis of social justice that a new and healthy atmosphere can be built up.

It is only when we (the supporters of Sardar Sarovar) can listen with respect and an open mind to the opponents, that the passions of 'WAR' can be converted and the Narmada Abhiyan can become a new beginning.

(Translated from Gujarati)

Manibhai Sanghavi,

Shri Gram Swaraj Sadaneelpar, Kutch 370165

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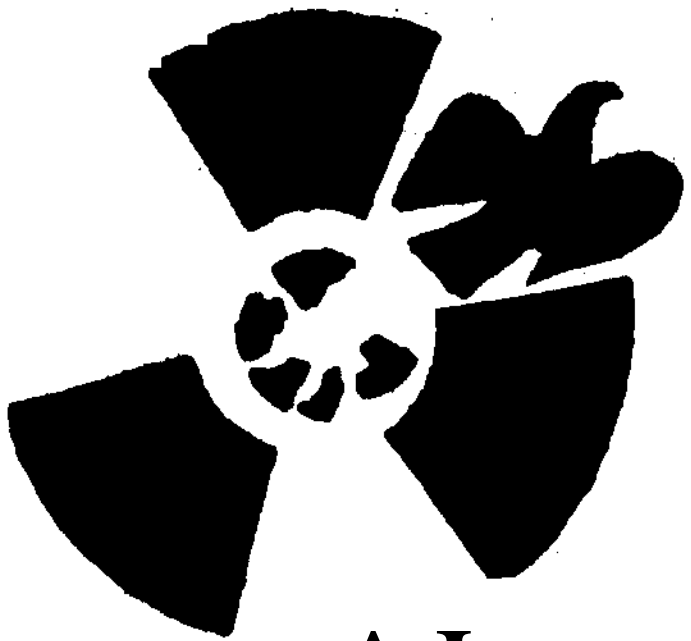
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ANUMUKTI

A Journal Devoted To Non-Nuclear India

Volume 3 Number 6

June/July 1990

Charabal is a river of central India. It is one of the very few Indian rivers which flows northwards. Its awe inspiring ravines are famous. The dacoits who inhabit these ravines have left their mark on our psyche. Sometimes as romantic characters fighting the injustice of the state, but more often as particularly blood-thirsty specimens of (in)humanity.

But Chambal is a river which meanders through many different terrains. And the tale I want to tell is of a different Chambal. A river of sorrow. A polluted river bringing death and disease to her children. Tamlao, Jharjhani, Deeppura, Bankheda, Eklingpura ... are names of villages situated on or near its banks a few kilometres this way or that from the reactors of the Rajasthan Atomic Power Project. During the sixties, a number of dams were built on the Chambal creating vast man-made lakes - Gandhi Sagar, Rana Pratap Sagar, Jawahar Sagar. A number of these villages had to resettle as the waters inundated their lands. But those were days of innocence. The villagers were told and they believed fantastic tales of the bright future that awaited them in the new dawn of development. Electricity, roads, schools, hospitals, jobs for everyone...

Well, years passed. The dams got built. With all the lovely cooling water around, nuclear power plants soon arrived. High tech progress took these poor folk by their hands and led them to the promised land.

But what did they find there after seventeen years? Jobs? The youth have now been forced to organise themselves into a *berozgar sangha* (unemployed's association) to agitate for jobs. Electricity? The applications of farmers for an electric connection are lying unattended for ten years. Roads? Even the officers of the nuclear power station are willing to admit that roads are in scandalous disrepair. They won't be able to evacuate people in a nuclear emergency during monsoons since even their jeeps are unable to get to most villages. Health care? For any serious complaint people have to go to Kota (50 km away).

The promised land is a land of despair. It is a land of mysterious tumours and malformed children (See Chernobhata? on page .3) Seeing these innocent children sacrificed at the alter of development one begins to wonder if the really bloodthirsty dacoits live on the banks of the Chambal or stalk the corridors of power in Delhi and Bombay.

An Account of Ourselves

"You don't take any advertisements, nor government help, nor funds from foreign funding agencies, then how does Anumukti survive?" I am often asked such questions by friends and fellow publishers of small magazines. Recently I was startled to hear that a story was doing the rounds that Anumukti was sustained by funds from the War Resisters International (WRI). To put such doubts and speculations at rest I am giving below Anumukti's accounts ever since its inception three years ago. We are very grateful to M/s. Chandrakant & Sevantilal Chartered Accountants, Bombay for having audited our accounts.

In December 1985, WRI had its three yearly gathering at Vedchhi. Part of the funds for this gathering were raised locally. However, after the gathering was over it was found that some of the money was left over. A resolution was passed by the organising committee to the effect that these left over locally raised funds be utilised by the Gujarat Anu Urja Jagruti in its antinuclear programme.

This money along with other locally raised funds was used in organising the 'Atom in India' seminar in Bombay in August 1986. At this seminar it was decided to have a journal which could serve as a means of communication between different antinuclear activist groups and educate people on these issues. Thus, Anumukti was born. As would be apparent from the accounts, Anumukti has never taken any money from these left-over WRI funds. The reason why Anumukti is able to manage on a shoe-string budget is because it is a purely voluntary effort. Sampoorana Kranti Vidyalaya, an organisation which does not take in any foreign or government funding owns Anumukti and underwrites any losses it might suffer. This safety net is a great help, though it is our effort to keep the Vidyalaya's contribution to a minimum. The total shortfall over three years has been Rs. 872.60 only.

Anumukti has been lucky that from time to time people have generously come forth and offered it assistance in the form of donations of money, equipment and labour. We are extremely grateful to Shri.I.J.Desai for having allowed us unlimited use of his personal computer. This has allowed us to typeset all the matter ourselves. Shri Bhaidas Parikh and the Parijat printery at Ahmedabad have helped us in greatly reducing the paper and the printing costs. Other friends have given donations to tide over emergencies.

Statement of Accounts

Income		Expenditure	
1987-88		1987-88	
Subscriptions and Donations.....		Printing.....	7,975.00
8,664.75		Postage	1,822.10
Vidyalaya Contribution	1,132.35		
Total	9,797.10	Total	9,797.10
1988-89		1988-89	
Subscriptions	13,215.13	Printing	8,974.13
Donations		Postage	4,241.00
3,581.00		Surplus	3,281.00
Total	16,796.13	Total	16,796.13
1989-90		1989-90	
Subscriptions	15,259.27	Travelling	3,190.75
Donations	2,400.00	Printing	9,513.00
Vidyalaya Contribution	3,321.28	Postage	7,170.80
Total	20,980.55	Stationery	692.00
		Bank Commission.....	414.00
		Total	20,980.55

CHERNOBHATA ?

This is a report of my first impressions as a doctor of the situation existing around the Rawatbhata reactors. It is not and neither does it purport to be a report of a scientific survey, though I feel that there is a great need for such a survey to be conducted immediately.

First a little geography. Rawatbhata reactors is something of a misnomer. The reactors are situated on the lands of a village called Tamlao. Rawatbhata is where the colony of the workers working in the reactors is situated and is about 11 km from the plant site in a northeasterly direction.

During the cycle rally, I was on a motorcycle and therefore reached Tamlao before the rest. To escape from the heat I took shelter in a small roadside shop and began talking to the people there. Some children were playing in the front yard. At first site they looked just like any other poor children of the region. But on closer observation I noticed that many of them seemed to have difficulty in movement. I called them over and examined them. Many of them had muscular weakness. Two had bone tumours. Just then I noticed that a shopkeeper across the road had a thyroid tumour and the shopkeeper next to him had a cyst on the cheek. An old man had a nearly two inch diameter cyst on the cheek.

I studied medicine in Calcutta. But even there I had never seen so many patients with tumours in a single day. On talking to these people in Tamlao I found that almost all the symptoms had appeared after five or more years of the reactor's commissioning.

The next day we were in Rawatbhata and heard that a child had been born recently with talipice (crooked legs) in a colony of cattle herders. We went to see him. While there his mother told us that her next door neighbour had a six month old baby boy with the same defect. When we went there, the lady said, "Oh, there is another seven month old girl just seven eight houses away who too was born with crooked legs. Nearby in another colony we saw a two year old boy

with the same problem and another two year old who had been born without any toes on both his legs.

Later we went to see Jharjhani village. This village is about eight to nine kilometers from the plant site in a direction opposite to Rawatbhata colony. The villagers claimed that at least 25 days a month the winds blew towards them from the plant. There every one I met, and I met hundreds of people, complained of stomach pains. There was a girl born here without one ear and another two year old who did not have a hand since birth. Again there were number of children with tumours. A very large number had polio. There were two orphan children both with large lumps in the abdomen. Many women and men complained of sterility.

On talking to shepherds I learnt that they have been seeing similar problems in their herds for a long time. One person told us, "You can go and check from Panchayat records that this village ten years ago had 5,000 goats and sheep but today there are hardly 500. I have had goats born with three legs by the dozen."

I have been studying about the health effects of radiation for the last few years. I knew beforehand that there could be various kinds of effects. Because of long term ingestion of radionuclides immune mechanisms would be disturbed and therefore I was mentally prepared to see increased incidence of different diseases, some cancers and genetic defects. But even in my worst nightmares I could never have imagined that I would see so many in so short a time in such a small population.

I talked to the authorities of the nuclear power plant. They said that the amount of radioactive releases from the plant were so small - just half of one percent of the natural background - that it was inconceivable that these diseases and deformities were due to radioactive discharges. They were inclined to blame air pollution and adulteration in cooking oils for the problem. However, enquiries revealed that there are no factories or industrial establishments of any kind other than the nuclear power plant and the Department of Atomic Energy

operated heavy water plant anywhere in the vicinity to cause air pollution.

From some workers I heard that there had also been a number of cases of cancers and birth defects amongst the plant workers and their children but I was not able to see their health records to confirm this.

The number of crippling deformities and handicapped people around Rawatbhata that I saw is certainly abnormally large. I doubt that radiation in low doses can cause this much damage. There have been no reports of such teratogenic effects in the vicinity of other operating nuclear plants anywhere else in the world. Although recently there have been some newspaper reports indicating increasing incidence of such effects around Chernobyl. Therefore, I suspect that the 'routine emissions' from Rawatbhata have been much larger than what is admitted by the

necessary for independent scientists to conduct their own investigation.

Seeing the condition around Rawatbhata I felt that here we are building new reactors in Gujarat, Karnataka, Tamilnadu, Andhra Pradesh and other places in the country. Will the same scenes be repeated in all these places a few years after the reactors begin operation? Would we see effects first in small domestic animals like goats and sheep and would there be deformed babies before even one generation passes?

Every citizen of the country needs to become aware of this danger. Now! If we want to save our land from this hell which goes on generation after generation the time for action is before these plants begin operation. I urge doctors, scientists and social workers living in the vicinity of proposed plant sites to be aware of this terrible danger. They should go to Rawatbhata and look for themselves and take action now so that a similar situation can be avoided in the future at other places.

Dr. Sanghamitra Desai Gadekar
Sampoorna Kranti Vidyalaya,
Vedchhi

Ek Ya Do Bus?

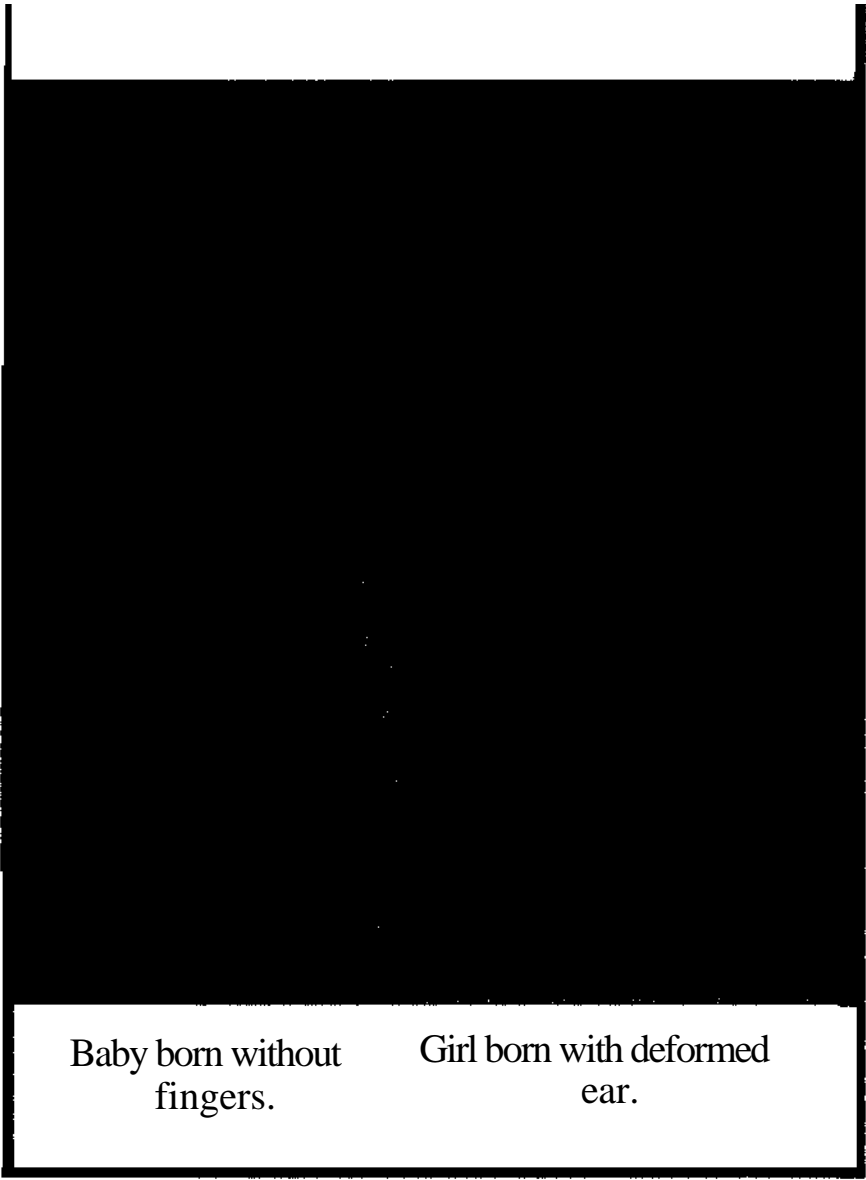
The Indian navy may have received a second nuclear powered Charlie I-class cruise missile submarine from the Soviet Union because the first submarine it leased may have experienced radiation problems, according to *Jane's Defence Weekly*. The first submarine called the *Chakra*, was commissioned last January. The second is reportedly named the *Chitra*. India is the only nation other than the five nuclear weapons powers to operate nuclear powered submarines....

The Bulletin of Atomic Scientists January/February 1990

India has decided to cancel plans to acquire six Soviet Charlie- class nuclear powered cruise missile submarines. Radiation problem on the Charlie, nicknamed "Chernobyl-class" in India, are apparently more severe than reported in *The Bulletin* last month. According to *Navy News and Undersea Technology*, one Indian scientist may have died from radiation poisoning suffered on board the submarine. India is likely to return the two submarines already received from the Soviet Union.

The Bulletin of Atomic Scientists: March 1990

Editor's Note: Will the advocates of "openness in government" confirm these somewhat mutually contradictory reports?



Baby born without
fingers.

Girl born with deformed
ear.

authorities. Or else there have been accidents and 'leaks' during its seventeen year history that the authorities have managed to hide from the public. Whatever be the cause, it is imperative that there be an immediate scientific investigation of the entire area. Even if there are no baseline health data for comparison, and it is criminally negligent on the part of the atomic energy authorities to have polluted the environment without having first collected baseline data, they and the government should immediately do comparison studies with areas without nuclear contamination and publish their findings. It is also

Dirty Tricks of Decent Men

Nucleocrats are as a rule rather dismissive of the prospects of alternative sources of energy. As an example, this is what Dr.M.R.Srinivasan, the erstwhile nuclear czar has to say in a recent issue of Seminar (No 370):

"There is much talk of non-conventional energy sources like solar, wind, tidal and biomass. All of them have their own limitations and their contribution can at best be marginal. Electricity from photovoltaic cells is very expensive. Power from windmills is meagre and unsteady. Tidal plants are too complex. Biogas and biomass can at best make a marginal contribution. Nuclear power thus seems to be the only viable source...."

Now normally one would accord great weight to such 'technical' opinion. Indian decision makers are more prone than most to accept such statements uncritically. But should they? Are nucleocrats impartial umpires in these matters which concern their own bread and butter (and jam) so directly? Below we present a case history from Britain where the honourable gentlemen were not very honourable after all.

The scandal of the lack of support given to renewable energy research and development in the UK, can only be understood in the light of the determination of the nuclear lobby to press on with Britain's nuclear programme at any cost, in spite of considerable public opposition. If benign renewable sources could be demonstrated as viable alternatives to the four pressurized water reactors (PWRs) which the Central Electricity Generating Board (CEGB) planned to come on stream in the 1990s, then Britain's plans to expand nuclear power would collapse.

In 1976, the Department of Energy (DEN) believed that wave power was "the most attractive of the renewable sources", while wind power was seen as being much less viable. It was therefore in the interest of the nuclear industry to boost wind power as "a winner" (though not too vigorously or it might itself become the alternative to the PWR programme) and run down the prospects of wave power. This the nuclear lobby did with great success, and in 1982 wave power research and development was closed down and wind power was established as the high priority renewable.

Sabotaging Wave Power

A number of wave power devices suffered from the decision to close down wave research in 1982, but the documentation available is largely concerned

with the device developed by Professor Stephen Salter at Edinburgh University and popularly known as 'Salter's Duck'. In simple terms this is a canister which bobs up and down on the waves like a floating duck, the resulting motion driving an electrical generator.

The consultants who had been appointed by the Department of Energy to help develop the various wave energy devices, reported in March 1982 that the design of the Duck was "near optimal in weight and efficiency, and ... must be assessed in terms of the probability of success or failure at the end of a significant development phase." They also believed that "*essentially the engineering stands or falls on the feasibility of achieving a very consistent maintenance free life as indicated. Experts consulted are not prepared to discount the possibility that this may be achieved if the necessary effort is made available*" (emphasis added). The consultants concluded: "Given the engineering means of realising it, the concept is hard to fault."

A unit cost of 5.5 pence per kilowatt-hour (p/kWh) was calculated for the cost of electricity from the Duck, and this was so close to the target set by the Department of Energy that for the first time it appeared that a renewable generating source might be developed to compete with nuclear power.

Although the Department of Energy is full of nuclear power protagonists, and those seconded to help the development of renewable energy sources did not always leave their nuclear commitment behind, the first engineer in charge of the Duck project, Clive Grove-Palmer, was well disposed and gave helpful criticism to the Edinburgh team. He gave a paper to the June 1982 Conference on Wave Energy Utilization at Trondheim in Norway, which estimated the development potential for electricity from the Duck as 3p/kWh. This estimate, which was made well before the conference, together with the consultants' report, forced the nuclear lobby into action.

A meeting of ACORD (the Department of Energy's Advisory Council on Research and Development) was held on March 19th, 1982. In an extremely unusual move, Grove-Palmer, the programme manager, was excluded from the meeting. Instead, a secret report (published eight months later by ETSU, the Energy Technology Support Unit, which is based at Harwell, headquarters of the UK Atomic Energy Authority, and like the UKAEA is controlled by the Department of Energy) persuaded ACORD that wind power had more immediate possibilities of being economic than wave power, and that the required reduction of the renewable research budget from

£ 14m to £11 m a year would therefore have to be met by closing down wave power research.

This £3 million economy in renewable research - the ostensible reason for closing down wave research - was enforced at a time when the Department of Energy was spending £200m a year on nuclear research. Both wind and wave research could have been kept going instead of terminating the wave programme on an estimate of wind power economics which was as over-optimistic as the estimates of nuclear power have proved to be. But worse was to come. Soon after the ACORD decision to close down wave research, Clive Grove-Palmer unexpectedly took early retirement.

[Grove-Palmer: I resigned ... Because they 1 asked me to write the obituary of wave power. There was no way I could do that - I had been involved with it much too much .Interviewer: And you think that obituary shouldn't be written?

Grove-Palmer: I'm sure it shouldn't, absolutely sure It shouldn't. We were Just ready to do the final year of development [and then go to sea. _____ J

After Clive Grove-Palmer's resignation, Peter Davies was appointed to take charge of running down the research of all the groups doing wave power work. His devotion to the cause of renewable energy can be gauged from the fact that he was later chosen to present the Department of Energy's case at the Inquiry into the proposed expansion of the nuclear plant at Dounreay in Scotland.

Casting Unfair Doubts

Perhaps even more disturbing is the case of the consultants' report. The main consultants (RPT), who had little electronic experience, employed a sub-consultant, Gordon Senior, with special responsibility for Ducks. He was able to subject the team's ideas to a considerably more rigorous scrutiny than had been done before, and he sat in on meetings with potential suppliers. After many long meetings, it proved possible to hammer out almost complete agreement between Gordon Senior, the civil engineers at construction company John Laing, and the team at Edinburgh. Unfortunately for the team, many of Gordon Senior's conclusions were reversed by people in RPT who had not been present at the meetings and who had very little contact with the work.

Gordon Senior gave written evidence to the House of Lords Committee on renewable energy, in which he concluded:

"My conclusions were the last part of the report to be formally drafted although my opinions had become well known to RPT as the work had progressed. My final draft of these sections was submitted in 'lay 1983. I expected a response from RPT within

days to discuss these consistent with our established practice. When this was not forthcoming I telephoned the RPT Project Manager to be told that the report had been completed, was to be submitted that night and could not be discussed. When pressed I was told that the conclusions had been altered. When I asked for a copy to examine what changes had been made I was told that no copy had been allocated to me and that copies were in short supply. When I pressed harder I was offered a copy on loan. I found that most of the text of the report was as I had drafted but the key conclusions had indeed been changed and even reversed. I objected and asked for my views to be made known to the DEN but was told that this could not be done and that I was bound by client confidentiality to RPT not to reveal my disagreement. I was also advised not to have further contact with the device team."

The next step was almost unbelievably bizarre. On the pretext of devising a system that would enable a simple comparison to be made of the capital costs of different renewable energy devices, the method of calculating the capital cost of the Duck was changed. The Duck had been costed on the basis of a detailed 140 page document, and by obtaining quotations against engineering drawings for all the bought in items. The official consultants prepared their own estimates, which were close, but a little higher. The Department of Energy's simple 'parametric' system replaced the 140 pages of detailed instructions with costings by weight, with just four different categories:

"Ballast costs- £50—£100/tonne; Concrete structures cost - £400—£600/tonne; Steel structures cost -£ 2000—£4000/tonne; Mechanical and electrical plant costs -£10,000—£20,000/tonne".

Such a system may be simple, but almost any renewable energy device comes in the last category and the costing penalize the heavier devices.

In the Duck, which has to be heavy enough to only just float, the welded steel lining of the power canister, its contents and the concrete casing, together weigh 300 tonnes. The quotation obtained for the steel lining from the Heavy Engineering Division of Whessoe Ltd was £850 per tonne for the 180 tonnes of steel. The Department of Energy insisted that it be costed at £ 10,000/tonne in calculating the cost of electricity from a Duck. Most of the machinery and electrical gear inside the power canister, and the concrete casing in particular, cost far less than £ 10,000/tonne, giving an average cost for the whole Duck of about £1000/tonne. Nevertheless, the Department of Energy insisted that the whole 300 tonnes be costed at £ 10,000/tonne. This added £2.7 million to the capital cost of each Duck, and with other lesser absurdities pushed the unit cost up to the 9.8p/kWh in 1987 prices quoted by the CEGB at the Hinkley Inquiry.

Faulty Cables

Possibly even more difficult to believe is the saga of the reliability estimate of the cables taking the Duck's electricity production to the shore collection point. If this cable has a fault, the Duck is out of action until the cable is mended or replaced. There should have been little difficulty in producing a reasonable figure from the worldwide experience with undersea electric cables. Norwegian figures showed that cable faults could be expected once in 625 years per kilometre of cable. The North of Scotland Hydro Electric Board has around 80 cables to islands off the coast, some of which date back to the 1930s without a fault; and their 43 km cable to Orkney, which suffers similar waves and much worse currents than those of the Atlantic wave fields where the Ducks would be stationed, has achieved 300 kilometre years without a fault.

The consultants' first report in November 1980 gave details of the data that had been used and estimated reliability at 333 year kilometres. This was only half the Norwegian figure, but meant that for a 10 kilometre cable a fault on average would only occur after 30 years - more than the expected lifetime of a Duck. However, in May 1982, a second report by the same consultants reduced the reliability to one fault in 100-125 year kilometres. In the summary, which was eventually accepted as a double misprint, it was given as one year per kilometre. How the estimate of the same reliability figure could have come down from 300 to 1 in official reports, without the final ludicrous figure (a 10 kilometre cable fail-

ing every month) being queried except by the Duck team, remains a mystery, since no data or references were given except in the first report. Professor Salter was prevented from discussing the problem with the consultants, who had been told not to answer his questions by a Department of Energy official.

The obstacles put in the way of the Duck and other wave research were legion. Yet another example is that according to the Department of Energy's consultants, building 1000 wave devices would, "be unlikely to show great reductions (in the capital cost of each device) from the manufacture of a single prototype", whereas, according to Department of Energy officials, building 10 of the 60 metre Orkney wind turbines would reduce the cost of each to a third of that of the prototype.

Salter concluded his original Memorandum to the House of Lords Committee thus:

"We must not waste another 15 years and dissipate the high motivation of another generation of young engineers. We must stop using grossly different assessment methods in a rat race between technologies at widely differing stages of their development. We must find a way of reporting accurate results to decision makers and have decision makers with enough technical knowledge to spot data massage if it occurs. I believe that this will be possible only if the control of renewable energy projects is completely removed from nuclear influences".

Excerpted from: *The Ecologist* May/June 1990

Nagercoil Demonstration

The somewhat dormant agitation against the proposed Russian built VVER nuclear power plant at Koodankulam has again entered an active phase following a big demonstration on 29th April 1990. The last such demonstration had taken place a year back under the auspices of "Protect Waters - Protect Life" march in May 1989. (See Anumukti Vol.2 No.6) Though there was a shooting incident during that march, there has been no enquiry into the incident as yet.

There were plans afoot to have a big rally sometime before the parliamentary elections but these had to be postponed as one of the leaders of the organising committee decided to stand as a candidate.

Though the April 29th rally was planned at short notice, it attracted a wide participation from various organisations amongst them National Fishermen Forum and Environment Protection Movement. Women's and students' groups also participated along with workers belonging to various political parties. The march started from Hindu College and

proceeded through Veepamodu junction, Monymeda, Nagarajar Didal, Kothar before ending in a public meeting near the railway station. The meeting was addressed by Mr. Tom Kochery, Dr. Kumaradhas, Dr. Mrs. Indira Surendran, Dr. Valanar and Mr. Mony amongst others.

There was a time when the Kanyakumari district was famous for its green appearance and had many water springs. However over-exploitation of ground water for the production of commercial crops like rubber and deforestation have led to a deepening of the ground water level and an infertile soil. Now, the Tamil Nadu government has declared this once green district into a drought prone zone. Thus, the issue of water has assumed a central role for the people of this district. The Nagercoil township at present receives municipal drinking water supplies only once in ten days. Some areas of the township get supplies once every two weeks.

The main source of fresh water in the district is the Pecheparai dam. Constructed by the Maharaja of Travancore during pre-independence times, its

waters have been used for irrigation only. Now, it is proposed to take these waters for cooling the reactors. Thus it is no surprise that the issue of water dominated everything else at the meeting. Two resolutions were adopted:

If the work continues with the aim of taking water from the Pecheiparai dam for the reactor, then the

people will remove all the stones which were marked for the plan line from the dam to the reactor.

The second step would be stopping of all payment of tax towards land and water.

Solomon Victus
37 Ponmeni Narayan St.
S.S. Colony Madurai-16

The Anumukti Cycle Yatra

All you really need is a megaphone. You halt at a street corner and start talking. People gather around, listening intently. Sometimes somebody asks a question. You explain. Some people nod in agreement others start leaving. Others in your group go around distributing leaflets describing the objectives of the yatra or with a donation box. Most people do contribute. You end with a song or two. There is an outpouring of good wishes. You climb your cycles and are back on the road again.

There were eighteen of us in all who set out on the Kakrapar to Rawatbhata cycle yatra sixteen on cycles and two on a motorcycle. Two friends had come all the way from Rajasthan just to join in the yatra. There was a local lad from Vedchhi. The rest were students and workers from the Sampurna Kranti Vidyalaya. Together we represented Orissa, Maharashtra, Rajasthan, Bihar, and U.P., besides Gujarat.

We planned to start from Vedchhi on 9th of April in the afternoon. The days just before departure were incredibly busy. The poster exhibition needed to be completed, the leaflets had to be printed, the cycles had to be collected from friends and well wishers and made road-worthy, the April issue of Anumukti had to be printed and on and on... It seemed certain that we would never be ready on time.

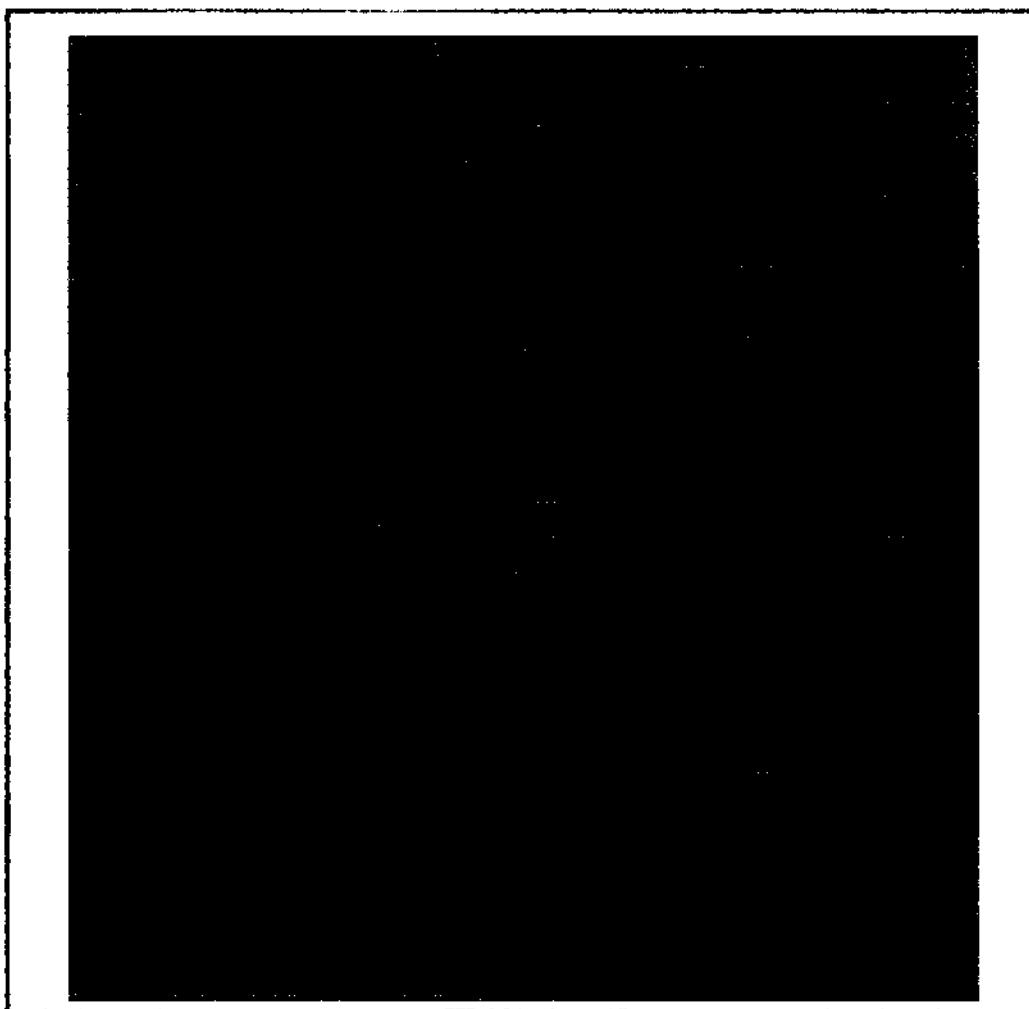
But come the scheduled time, wonder of wonders, we were off. In the morning we had a meeting at

which friends from the Vedchhi area had come and wished us success. But at the time we left, our only audience were three policemen who radioed our departure to their superiors. During the trip, right up to the borders of Gujarat we were accorded the honour of an escort by the guardians of the law. After all the main purpose of our yatra was to spread awareness amongst the people of the dangers posed by the nuclearisation of the country. And all governments know instinctively that public awareness is something that is detrimental to public order. Our first night halt was Bedkuadoor, a small village some

five km from the Kakrapar atomic power plant. The route we had originally selected was under repairs and we had to make a detour which added 15 km to the journey. It was dark by the time we reached our destination. The police van stuck to us like a limpet. In fact its headlight illuminated our path. This close attention did achieve its objective of intimidating our hosts. No public meeting was held and even a private showing of a video film had to be cancelled.

Mandavi is a taluka town just five km from Kakrapar as the crow flies. We started after sunrise and dilly-dal-

lied over a bath in the river Tapti. Our local hosts had arranged a meeting for us but had not been able to advertise it. Seeing our megaphone they asked us to go all over the town in a procession and invite people for the meeting. However, we found that a lot of people would just gather wondering what was being announced on the megaphone. So besides having our scheduled meeting we had six other street



corner meetings. The lessons learnt that day in Mandavi were to stand us in good stead throughout the trip.

We stopped over for lunch at a girl's school at Roopan. It was examination time but yet the girls made us welcome and listened to us with great attention. On our way to Netrang in the afternoon we had a very good meeting at Zhankhwao. But Netrang was a disappointment since a visit by the local gendarmes had made our local hosts cancel our programme.

The first two days were physically the most tiring. We got up at 4.00 AM next morning and left for Rajpipla. Travelling by the light of the waning moon in the cool weather with soft breezes blowing was so enjoyable that we made it into a regular habit for the rest of the trip.

Mangrol, which was our next halt is a beautiful village on the banks of the Narmada. Swimming in the river was a special pleasure. The programme had been organised by Aradhana, an old student of the vidyalaya and lasted well into the night. The whole village came and when we left the next morning our numbers had been increased by the addition of Jyotish who accompanied us all the rest of the way.

For the next few days our route lay through the valley of the valley of the Narmada. Here the main question in people's minds was the Sardar Sarovar dam. There had been strong protest and brutal police suppression at Alirajpur just then.

Our last halt in Gujarat was at Rangpur - the village which has become famous as the origin of the Lok Adalat concept. Shri Hari Vallabh Parikh had arranged meetings for us in five different villages and accompanied to all of them despite the lateness of the hour.

We entered Madhya Pradesh the next day at Bakhatgarh and proceeded towards Attha. There was a phase transition in the condition of the roads which became incredibly bad. One began to understand the meaning of the word "doob-kshetra". The government just doesn't carry out any repairs since any way the area is to go under water after the dam starts filling up. The funny thing was that most of the road we travelled was not in the "doob".

The scenery in this part of Jhabua district is very beautiful. The mountains just roll on and on. Unfortunately, nay criminally they have been denuded of most of their forest cover. We made slow progress since punctures were plenty.

The work being done by a group of young activists Amit, Jayshree, Rahul and Narendra at Attha in extremely trying conditions is an inspiration. We had a good meeting in a house on top of a small hill and then left for Jhandana. However, we made an unscheduled stopover at Temla. (See Box)

The sun went down as we reached the banks of the river. There wasn't much water in there but plenty of sand. We got off our bikes and trudged across. A snake's carcass lay near a stone. It took us some time to decide on the path to take since there were quite a few paths emerging on the other end. All of us were tired and dusty and beginning to feel very hungry. We wished our night halt wasn't another 15 km away.

Temla is a small tribal village. Maybe, some twenty to thirty houses. There was a house by the roadside. Uma walked in while the rest of us waited outside. She asked for water to drink. An old woman came out. "How can you drink the water that has been touched by me. You better go to the Patel's house. It is nearby," she said. "No way", Uma answered, and added "We will all drink water here."

Young men from the village gathered around. We told them that we were on a cycle yatra and about the purpose of the yatra. They invited us to stay the night with them. "Food is no problem" they told us. They were terribly poor and there were twenty of us, all hungry to the core. Yet they did not hesitate for a moment. They collected two rotis each from every household. Some Bajara, some Jowar and made us some Dal.

It was a delicious meal. After the meal the whole village gathered together. We sang songs, danced together, tapped an overhead electricity line to show them slides of Hiroshima, talked about what development means and what it ought to mean. Our tiredness disappeared in the warmth of their welcome.

Early next morning, well before dawn, we were on the road again. Meeting people, shouting slogans, distributing pamphlets, discussing issues ... but most of all pedalling on, negotiating the road and fighting the heat. Temla was etched in our hearts.

The high-point of our trip the next day was the meeting with Baba Amte. He had come to Badwani to address a meeting on the occasion of Ambedkar Jayanti. Unfortunately not all of us could meet him. We stayed the night at Chikhaldra on the banks of the Narmada and had a fantastic introduction to our staple food for the next few days - Bati and Dal.

By now our daily routine was set. The aches and pains of the first few days were a distant memory. All of us had realised the pure joy of riding before dawn and thus there were no complaints at all at getting up at four in the morning. We would try to cover about 25 km in the first two hours, then have breakfast and cover another 20-25 km in the next three and a half hours with a good number of roadside meetings. By then it would be too hot to do anything but rest. If we had farther to go we would do that late in the afternoon.

From Chikhalda to Khalghat we made a lunchtime halt at Dawana. A local householder Sbri K.L.Tiwari heard that we were passing by and there was some difficulty about feeding us. At the time he and his family members were just about to sit for their own meal. But true to ancient Indian tradition regarding hospitality to guests they prepared a sumptuous meal for us first and only later took their own food.

That night at Khalghat, for the first and the last time during the whole trip we prepared our own food. We spent the night in the premises of a temple. All of us pitched in into the making of the meal and it was good fun.

The next leg of our journey, from Khalghat to Indore was the longest of the trip. A little over 100 km. Also, there were the Vindhya mountains to cross. We were all tired by the time we reached Indore but were sustained by the knowledge that the next day was to be a day of rest.

At Indore, our party was increased by two. Narayan Desai, at 66 the oldest member of the group and my daughter Dua, who at 6 was the youngest joined us for the rest of the tour though they did most of their travelling in buses. The programme at Indore was somewhat of a disappointment. The press conference got hijacked on the question of Kashmir while the public meeting had a very thin attendance. On top of this the mosquitoes were something fierce and their numbers would have done credit to a large colony of bacteria.

Eklavya, our hosts in Ujjain had organised a meeting with the bar council. The discussion became rather lively with questions on the bomb option dominating. The meeting lasted two hours beyond schedule.

On the road from Ujjain to Mahidpur, we had our first experience of an adverse wind. Our route till now had been in a north- easterly direction generally and the wind's had usually been favourable. The bath in the river Shipra after reaching Mahidpur was an extremely welcome interlude. The meeting that night in the Mahidpur bazaar was well attended and we had an enthusiastic response.

The road from Mahidpur to Jaora was a torture. The winds were strong and they were dead against us. We somehow made it to Tai for our morning halt. We wanted to have a bath in the river (Chambal) but were warned against it by the villagers who said that the water was too polluted with chemicals from the factories at Nagda and a bath was likely to cause outbreak of itching and rash all over the body. There was an unexpected surprise in store for us at Tai. Sunil, one of the organisers of the Rawatbhata convention and our contact person there came to meet us. From then on he was to be our constant companion for the rest of the trip. He had before coming

personally visited a number of villages and small towns on our route and made arrangements for our stay and meetings.

During the next few days we had well attended and enthusiastic meetings in Mandsaur, Manasa and Rampura. There were extensive discussions at these meetings and at times sharp questions were asked. But the people who came had an open mind and were willing to listen to an alternative point of view. Our yatra was reported extensively in newspapers and there have been follow up reports coming in newspapers since. Thus, in the sense of a continuing public education programme, the greatest success of the cycle yatra was in these small towns near the M.P. - Rajasthan border. This encouraging response has also made us think in terms of organising a week's camp on nuclear issues sometimes in the winter in one of these places.

The last night on the road was again a very different experience. We stayed at the Gandhisagar dam as guests of the dam authorities. The contrast between this official reception and the official hounding by the police in Gujarat was an interesting example of the right hand of the government not knowing what the left was up to. We were overjoyed by the fact that 12 youths from Rawatbhata had come all the way (55 km) to welcome us and the next day they accompanied us on cycles.

The last day of the yatra was the most memorable. All during our trip - a distance of nearly 1,000 km we had not come across a dense jungle. This despite the fact that most of our route lay through lands that are officially 'forests'. Near Gandhisagar, this great lacunae was fulfilled. There were thick forests. But they were the strangest forests we had seen since in this hot season they did not contain even a hint of greenery or leaves of any other colour. We had our largest public meeting of the trip at Eklingpura - a village of persons displaced by the Gandhisagar dam. Even after the meeting, a number of women were still wanting more information and they had a separate meeting with Sanghamitra. Contrary to our regular custom we left Eklingpura early in the afternoon since we wanted to reach Rawatbhata before nightfall. The Sun bore down with merciless fury. Whatever little water we had brought along was soon consumed and the last ten kilometres were a special agony. Relief finally came at Tamla. We had enough to drink but more than enough to think. (See Chernobhata? page 3)

Although the cycle yatra formally ended at Rawatbhata, there were further adventures in store for us on our return journey. We came by train from Kota to Baroda and then loaded the cycles on top of a bus for further journey. Near Surat we had to cross an overhead railway bridge and five cycles came crashing down. Fortunately no one was hurt, though two bikes got completely smashed.
Surendra Gadekar

Chernobyl Day at Rawatbhata

The construction of the first unit of the nuclear power plant at Rawatbhata originally started in the sixties along with dams. At the time the people of this sparsely populated corner of Chitaur district welcomed the move. They were seen as new 'temples' of development. But now the local people have started feeling the harmful effects of radiation. At the same time the government proposes to expand the number of units from two to eight and work has already begun on units 3 and 4. It was with this background in mind that the sarpanch of Rawatbhata, Shri Ratanlal Gupta and his colleagues decided to organise a convention so that people could rethink the issue and try to come to an independent judgement.

The meeting was attended amongst others by physicists, medical doctors, environmentalists, social workers, thinkers and intellectuals. There was a fair amount of local participation. A rally was taken out before the meeting from Rawatbhata bazaar which walked 3 km before ending at Charbhuj temple.

The meeting was chaired by Shri Gyanchand Jain. It began by observing a two minute silence in memory of the Chernobyl victims.

Local residents were first invited to share their experiences. Shri Bhawani Shankar of Jharjhani said that in the last five or six years the incidence of T.B. and cancers had increased tremendously in his village. He also said that sterility had become common amongst the youth. Also there had been significant reductions in both the number of cattle and in their milk yielding capacity. Saleh bhai from Mandesra said that while the villagers had been made to share the dangers of atomic radiation equally, the power plant authorities had discriminated against them as far as benefits like health care and educational opportunities were concerned. The sarpanch of Badoli said that reports concerning the leak of H₂S gas from Heavy Water plant had been suppressed by the authorities though the leak had affected both the villagers as well as security persons at the plant. The chairman of the unemployed youth association, Shri Rajoria said that the atomic power project had not benefited the local community in any way. A social worker Shri Rishilal complained that while the power plant authorities had made many promises they had not fulfilled even one of them. Even serious patients had to first deposit Rs. 2,000/- at the plant hospital before they were admitted. Many patients had died in the process of depositing the amount.

The chairman of the CITU affiliated Rawatbhata Atomic Workers Union, Shri J.C.Gupta demanded

that an independent enquiry be made into the health effects felt by the workers as well as the local population. He said that the health records at the plant hospital should be made readily available to outside independent experts and the findings of the enquiry should be published. For how long will the government be able to fool the workers through attractive wages and allowances, he asked.

Amongst the visitors from outside who addressed the gathering were Dr.V.L.Talekar, a student of Sir C.V.Raman, the famous Gandhian thinker Narayan Desai, community health worker Dr. Sanghamitra Gadekar, Dr.Susbil Joshi of Eklavya Hoshangabad, Shri Sajjan Kumar of the World Peace and Environment Protection Organisation New Delhi and Dr.Surendra Gadekar of *Anumukti*. They discussed many different aspects of the nuclear issue in detail.

The gathering adopted three resolutions which demanded that there should be no further expansion of the nuclear project; that the project authorities should be responsible towards providing civic amenities such as roads, schools and hospitals etc to local population and information regarding radioactive discharges from the existing plants should be made available to the public.

On the next day, the 26th of April a seminar on Nuclear Power Plants and People's Health was organised. Before the seminar authorities from the plant distributed sets of papers which claimed that radioactivity releases from the plant had in no way affected the health of the local people. Later during questioning they retracted their claims and agreed that radiation in any quantity could produce harmful effects. The papers also stated that antinuclear activists were part of an international conspiracy to keep India backward. The papers did not bear the name of any person or organisation as printers and publishers.

During the seminar, the need for a detailed investigation of the health effects on humans and animals was strongly felt. At first the authorities claimed that they had carried out a baseline survey before the reactors had started, but later, on being questioned, admitted that their baseline survey had not been concerned with people's health.

*Ram Pratap Gupta
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(Translated from the Hindi original)*

Review

The *Greenpeace* Book of the Nuclear Age
The Hidden History The Human Cost
John May
Victor Gollanez Ltd London 1989

"In California's Mojave desert in 1949, Major John Paul Slapp had just risked his life on an experimental rocket sled that pushed him beyond 31 Gs - 31 times the force of gravity. He survived only to discover that none of the G - measuring devices had worked. Captain Edward Aloysius Murphy Jr was called in to find out what had gone wrong. He discovered that somebody had installed each of the six G-measuring devices backwards. "If there's more than one way to do a job and one of those ways will end in disaster, than somebody will do it that way," Murphy remarked. Murphy's law was born."

This book contains lots of stories. Real life stories. They are stranger than fiction. If a film were made on this book it would resemble one of those *Carry On* series. Unfortunately these stories are not funny. They are too real and tragic. In these stories, valves never work, computer programmes glitch, barrels leak, weather conditions are never right: the unexpected, the bizarre, the last-thing-anyone-would-have-expected, has an annoying habit of happening. Murphy would understand.

This is a book which ought to be read and reread by every antinuclear activist. The prose is remarkably lucid and the stories just grip you due to their strong human interest. Unfortunately, its price is way beyond most Indian pockets. However, it is available in British Council libraries and those who have access to these should make full use of them. But even more compellingly this book ought to be read by young scientists working in the nuclear establishments. Only the realisation of their own and their instruments fallibility will save the rest of us.

We will carry some of these stories in future issues of *Anumukti* and also translate them into Hindi for access to a wider public.

Excerpt

This is a book about accidents and risk, about the nature of chance and the oppressive weight of secrecy, about invisibility and intrigue, about tragic events, about causes and effects, about official lies and the true human cost of atomic energy.

The world described in this book exists all around us, like an alternative reality. It is a world where human error meets sophisticated technology, where people make a sequence of logical decisions for the right reasons only to find that they have created chaos. Where there are many versions of the truth.

This book will introduce you to the black briefcase in the red shack, take you on a helicopter ride over a burning nuclear core, into a damaged reactor in which life forms are breeding, and through a realm of black humour and mystical coincidence.

Because the effects of radiation take decades to reveal themselves, almost all the stories in this book are current, even though some of them begin in mid 1940s. In this context information develops its own half life - the amount of time it takes for the official truth to leak out of the canisters in which it is contained.

There is a new geography here, with a new set of significant points and a complex network of inter-connections. Nuclear material is constantly on the move around the globe, it is stacked in caverns deep in the earth, and dumped in deep-sea trenches. Above our heads nuclear powered satellites produce high resolution images of nuclear navies.

Souvenirs of our journey round this planet might include sand alchemically transformed by the heat of a nuclear blast, a belt buckle from a drowned Soviet submariner, an irradiated restaurant table leg, a nuclear warhead dropped by accident in someone's back garden.

The route runs from Alamogordo to the Z-9 buildings at the Hanford reservation, via desert test sites on the edges of Mongolia, Pacific coral reefs, the Antarctic, a Swiss cave, the Himalayas and the inner reaches of outer space.

The stories in this book bear witness to the daily risks we are running and the night time dangers inherent in the nuclear dream. They lift the shroud that cloaks an enormous industrial enterprise designed to defend rival ideologies: an atomic Papacy of Byzantine splendour and colossal scale with deep and historic institutional roots and a secretive bureaucracy.

Against this are ranged the unborn, the innocent and the unsuspecting. The widows of the ex-servicemen who happily posed for pictures in the Pacific sunshine on board irradiated battleships in 1947, and collected a cancer along with their discharge medal. The children of Kiev, who were not evacuated until after their traditional May day parade had been dusted with radiation. The Navaho shepherds, the Mexican steel workers, the Marshall Islands Islanders the Australian Aborigines - all have been on the receiving end of this invisible threat.

Operation Hat

If some nuclear accident stories read like scripts for Hollywood disaster movies, then the story of Operation Hat reads like a script for a spoof spy caper.

Operation Hat began shortly after China's first nuclear bomb test in 1964. The US CIA, with the

cooperation of the Indian government, planned an expedition to the Himalayas to plant a nuclear powered monitoring station on the summit of the 26000-ft- high Nanda Devi, from where it would eavesdrop on the Chinese nuclear test programme in over-the-border Xinjiang Province.

The Agency recruited several top US civilian climbers who, together with four of India's best climbers from the 1962 Everest expedition, formed the cadre of the ill-fated Operation Hat. Far from succeeding in eavesdropping on the top-secret Lop Nur nuclear test site, Operation Hat was destined to threaten one of the world's great rivers with plutonium contamination.

The US climbers and their Indian colleagues set out up the south face of Nanda Devi in the autumn of 1965. A squad of porters carried the disassembled monitoring station, together with its SNAP power pack, on their backs.

the SNAP - Space Nuclear Auxiliary Power - generator was a nuclear battery originally developed for the American civil and military space programme. Shaped like a cone, SNAP was fuelled by between one to eight lb of plutonium, was small enough to be carried by one man, and would power the monitoring station till its task was completed. The CIA would then send a second expedition to recover the monitoring station, SNAP and all.

Operation Hat ran into the first of its many difficulties when the expedition encountered severe weather and rock conditions. 2,000 ft from Nanda Devi's summit, the climbers decided to turn back, but not before they had cached the monitoring station which would await their return - when the conditions improved.

The climbers ventured back up Nanda Devi in the spring of 1966, but were dumbfounded to discover that winter avalanche had swept the spy station from the mountainside. The vital SNAP generator, and its plutonium were now entombed under a mound of rock and snow the size of a Giza pyramid.

The CIA and the Indian government were in a quandry. The southern slope of Nanda Devi, where SNAP lay buried is a major source of headwater for the Ganga. A holy bathing place for pilgrims was just a few km downstream from the SNAP site. If SNAP were to break open under the weight of the avalanche, there was a real risk that the hallowed waters of the Ganga would be polluted with deadly plutonium, and both the Agency and the government would face the wrath of millions of people.

Over the next two years, expeditions to locate and recover the SNAP returned empty-handed. Eventually, after water sampling of the Ganga revealed no contamination, the decision was made to abandon

SNAP in the hope that it would remain intact and that Operation Hat would remain a secret.

The secret of the lost SNAP was kept until May 1978 when the US journalist Howard Kohn revealed the existence of Operation Hat in the Outside magazine. In a masterly worded non-statement to the Indian Parliament, Prime Minister Morarjee Desai tried to defuse the danger of SNAP: "The indirect evidence so far is that the safety precautions built into the nuclear powered power pack may be as effective as claimed and, if so, pollution effects may not take place in the future."(The Times 18.4/78)

In 1967, Operation Hat finally scored a success. A second SNAP- powered spy station was placed on, and eventually recovered from the slopes of the nearby Nanda Kot mountain.

The first SNAP is still there, entombed under thousands of tons of rubble. Many nuclear experts disagree with Morarjee Desai. They say that the SNAP generator will eventually corrode and disintegrate, releasing plutonium into the headwaters of one of the world's great rivers.

Western Middle Powers and Global-Poverty : The Determinants of the Aid Policies of Canada, Denmark, the Netherlands, Norway and Sweden
Ed. Olav Stokke
The Scandinavian Institute of African Studies, Uppsala 1990

The 20th century is coming to a close. The future perhaps lies in what Ivan Illich - a pastor, a reformist, a seeker of alternative ways says, "During the next several years I intend to work on an epilogue to the industrial age. I want to trace changes in language, myth, ritual and law which took in the current epoch of packaging and of schooling. I want to describe the fading monopoly of the industrial mode of production and vanishing of the industrially generated professions this mode of production serves. Above all I want to show that two-thirds of mankind still can avoid passing through industrial age, by choosing right now a post-industrial balance in their mode of production which the hyper industrial nations will be forced to adopt as an alternative to chaos" (*Tools for Conviviality*).

Is someone listening? Listening to the woes of the poor, to the cries of the malnourished and diseased women and children of the third world? The study gives an answer with respect to five countries viz. Canada, Denmark, Netherlands, Norway and Sweden. It analyses all the official data available.

Giving aid to a poor country is not simple. A poor country does need support, but of what kind? Will giving capital investment for industry be helpful? Would "know-how" by itself be sufficient for creating positive change? Would a project of health care

and family welfare help to remove the main causes of poverty and help the people solve their own problems? Would financial support not turn them into seekers of doles and subsidies? Besides the commercial interests of the donor nations do not want to suffer. These are aspects of "aid giving".

The study documents in great detail with the help of many tables the efforts of the donor nations. All the five countries have tried to reach the goal of "One Percent" of the GNP in spite of the fact that other developed countries as a whole have lagged behind in their efforts. Norway stands out and it has continuously maintained a high profile aid programme.

Major aid has flowed from these countries through UN agencies, yet there has been an attempt to provide bilateral aid. There is also a recognition of the role of NGO's. But this study does not provide any details on receiving countries except their geographical locations. The impact of the aid and its implications to both parties do not fall in the purview of this analysis. This reduces its usefulness. It does give an insight into how donor countries behave and why they behave that way but it is not bothered about what happens to the receivers of the aid. It is centered on the interests of the five countries, in international affairs, aid policies, and commerce and their altruistic ideals.

The introduction of new environmental and consumer standards in the EEC, the report predicts, will increase environment pollution in the Third World. For example, EEC manufacturers unable to meet the high environmental standards at home after 1992 will transfer the "dirty" stages of their production to developing countries where regulations are lax or non-existent...

The report regrets there has not been sufficient research to estimate overall trade costs and benefits to particular countries. The community needs to take positive steps in the key area of trade, debt and aid to assist poor countries to adjust to and benefit from single market."

Excerpt

"While the future may contain unforeseen changes in the domestic and external environments, one observation about past performance is of particular importance: the aid policies of the five countries have shown a high degree of continuity and a low degree of change, despite the substantial changes which have taken place both in the domestic environment of the five donor countries and in the international environment, particularly in the Third World. The continuity of the main patterns of their aid policies covers a relatively long period of time 15-20 years. This implies that few dramatic changes may be expected in the basic patterns of their aid policies." (page3/3)

"The main determinant as far as the large multilateral aid components are concerned, has been the systematic policy interest of middle powers in peace and stability and in a global system for the maintenance of these international common good concerns. The five countries have considered a large multilateral development assistance component an instrument to this end." (page 3/4) This augers well for the future. Effectiveness of multilateral agencies to the avowed aims will determine the aid programme.

"If the main trend so far continues, it is likely that in the future, foreign aid will be even more strongly directed towards the international common good than in the past. Although social and economic development will remain the core objective, foreign aid is likely to increasingly used as a tool to attack more immediate threats to mankind, where the connection between objectives and means would appear immediate and direct." (page 3/7) And three possible threats are considered.

- The threat to the future of our planet earth and to our common destiny, caused by the pollution of the biosphere and environmental degradation.
- The threat to health.
- Crisis Management - debt crisis - threat to international economic system and the private sector (the banking system) of some major powers in the North.

Jyotibhai Desai Vedchhi

The Glow on the Greens

We golfers have had a tough time of it lately. Golf courses not only take up a lot of land, but they have begun to be identified as major polluters because of the run-off of pesticides and fertilizers used to keep those greens and fairways the way we like them. In some low-industry areas (and when was the last time you saw a golf course next to a steel plant?) a golf course may actually be a region's largest polluter.

But Atomic Energy of Canada (AECL) has really gone too far. AECL is attempting to develop the world's first irradiated golf ball. Seriously. AECL scientists apparently figured out that irradiating a golf ball can change the molecular structure of the ball's core, producing larger molecules that may result in an 8% increase in the liveliness of the balls.

Not only we do believe this is an appalling perversion of nuclear technology, and results in the most frivolous production of radioactive waste we can imagine, it is also entirely illegal. The U.S. Golfing Association will simply never permit it. After all, some organizations still do have standards - even if the ball does glow in the dark.

(The Nuclear Monitor, May 7, 1990)

11th April 1990**A Message of Solidarity from Japan**

We sincerely congratulate you on the anti-nuclear convention you are having on 25th and 26th of April. We express our whole-hearted solidarity. Since it has been quite difficult to know about the nuclear situation in your country, it was especially delightful to hear about the growing antinuclear movement in your country. Japan is one country which is still going ahead with its nuclear expansion programme, even after the Chernobyl accident. Despite the growing concerns about safety and the effects on human beings and the environment, Japan is still continuing with its nuclear fuel cycle plan, which envisages the production of the most deadly substance - plutonium. This is bad news not only for Japan but for the whole world. It is of special concern to our neighbours in Asia since the Japanese industry may be planning to expand in whole of Asia. However, we are happy to say that due to the widespread antinuclear movements throughout the country after the Chernobyl disaster, nowadays more people are aware of the dangers of nuclear plants. We have succeeded in electing three antinuclear Diet members from Aomori Prefecture where the nuclear fuel cycle facility is planned and also the Mayor of the site has declared a freeze on this plan. We have collected more than 2.5 million signatures asking for a nuclear phase out law, which will be submitted to the Diet on the 27th of April, the first day of the three day rally commemorating the 4th anniversary of Chernobyl disaster. We are also holding a big nation-wide festival on these three days including a symposium, peaceful demonstrations and an antinuke concert, with guest speakers from USSR, Germany and Korea. Let us join hands across the world to stop all nuclear related facilities. Let us join hands so that we can exchange information to halt all nuclear industry's movements before they actually occur. Let us join hands so that we can create a peaceful and happy environment for our children.

From all the participants
4th Commemoration of the Chernobyl Disaster
No Nukes One Earth Festival
Tokyo, Japan
28th and 29th April 1990

Recently we received a copy of a letter written to the Nuclear Power Corporation of India by Sigma Equipments - makers of a wide range of ovens and furnaces. We are reproducing it in the full since we hope it is the forerunner of many such letters by other public spirited entrepreneurs and industrialists.

M/s. Nuclear Power Corporation of India Ltd
. P.O. Anumala
Via Vyara 394651

We have received your tender enquiry (No:CMM/KAPP/4920 Due on 30.4.1990). We manufacture a wide range of ovens and furnaces. But as a matter of principle we do not deal with organisations concerned with atomic energy generation. Our stand is based on the following facts:

- Nuclear energy is the source of one of the most dangerous kinds of pollution. Radiation at any level is harmful to life and the environment.
- As radiation cannot be measured by ordinary means nor can be sensed by the people, atomic energy experts have succeeded in keeping the population in the dark.
- The harm that the radiation can cause may not be felt in the near future but can be passed on to the coming generations in the form of damaged genes.
- This subtle violence against life and nature is irreversible.
- There is no method yet devised to safely decommission a reactor after its short life of 25 years or so is over. This is a totally unjustifiable liability we thrust upon generations to come.
- For perpetuation of the evil of nuclear energy its various agencies are controlled by the power of the state. In countries where people could have a say, the dream of nuclear energy has evaporated.
- There is always the possibility of a major accident like that of Chernobyl as even for the most perfect machinery the human factor cannot be wholly eliminated.
- Nuclear power generation is a big drag on the progress of a poor country like India. With the same amount as sunk in this large scale ego trip, a lot more power can be generated in a decentralised and safer way.
- The cover-up provided by the government to the nuclear energy establishment in the form of the Atomic Energy Act is contrary to the spirit of democracy.
- The nuclear establishment has kept alive the option of a nuclear bomb which is madness of the highest level.

In view of the above considerations we have no option but to blacklist your organisation.

Kersi Sabawala Baroda

Along with this letter I am sending some cuttings. They are from the newspaper of the IEEE (The Institute of Electrical and Electronics Engineers) called 'The Institute'. I collected these cuttings due to my interest in nuclear issues as an electrical engineer looking into alternate energy research. As these articles are written extremely equivocally someone who can read between the lines on such issues needs to go through them. That is why I am sending them to you: maybe you can find something about the trends and attitudes regarding nuclear issues in the U.S.A. and use the material in *Anumukti*. I have been reading *Anumukti* for the past year or so. *Anumukti* is doing very valuable work. Its only limitation is a low circulation - can you send in some of your material to more widely read newspapers and magazines to educate a wider public about your stand?

Johara Shahbuddin,
14 Janpath,
New Delhi 110001

I am a member of the research team at the Centre for Industrial Safety and Environmental Concerns and I have been working in the field of high natural background radiation. This letter is to inform you that a group has been formed called "Women Against Nuclear Energy" (WANE).

We feel that till now other women's groups in Kerala have not considered nuclear issues seriously. Thus although we are concerned with other environmental and women's issues as well, we feel that prime importance needs to be given to nuclear issues. The present situation in Kerala is bad enough; we are having the country's first commercial food irradiation plant; a nuclear power plant is in the works; and there is very high natural background radiation in the coastal regions of Kollam.

At present we have six active members. Membership is not restricted to Kerala women only. In the future we plan to have a national network. We would love to hear from other groups and individuals interested in this idea. We are also planning to have a documentation system and exchange materials with others in this field.

All India Women's Conference is scheduled in December 1990 in Kerala and one of the themes of this conference is "Nuclear Energy and Women".

Ms. Nandini K Nair
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Kottayam 2 Kerala

On 26th April, we had organised a seminar here at Calcutta. Physicist, Dr. A.L. Mukherjee presided over the meeting. Among other noted speakers were Prof Sushil Mukherjee — ex VC Calcutta University, Playwrite Badal Sirkar and Prof Sujay Basu. On that day our new journal *Safe Energy and Environment* was released.

Dipankar De 28, A.V.L. Street, Calcutta

Native peoples tell us that uranium should stay in the ground - but their voices are lost in the wind. Tribal peoples possess the knowledge of the past that could help heal and restore the earth - but their views are in conflict with the nuclearized, neo-colonial mindset of the multinational energy corporations. It is time we listened to the native peoples of the earth. Before corporate wealth capitalizing on our ignorance, wipes out their cultures. Their wisdom may hold our last chance.

The World Uranium Hearing will see to it that no one can say: "I was never told."

During the late spring of 1991 for one week in Copenhagen, Denmark, the Hearing will provide a forum for those indigenous peoples who have been victimized by our nuclear energy policies - together with those whose lives have been jeopardized by testing of nuclear weaponry - to make their grievances public. For more information please write:

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